BLM LIBRARY
88016607

FINAL
Mobil-Pacific Oil Shale Environmental Impact Statement

Volume II - Appendices

OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE O
IL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OI
L SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL
SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL
SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL S
HALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SH
ALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHA
LE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHAL
E OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE OIL SHALE

Prepared by:

Bureau of Land Management
U.S. Department of the Interior

with the assistance of:

Dames & Moore

TD
195
.04
M63
1984b
v.2

ID 88016607

BLM Library
D-553A, Building 50
Denver Federal Center
P. O. Box 25047
Denver, CO 80225-0047

TD
195
.O4
M63
1984b
v.2

FINAL
Mobil-Pacific Oil Shale Environmental Impact Statement

Volume II – Appendices

Prepared by:

Bureau of Land Management
U.S. Department of the Interior

with the assistance of:

Dames & Moore

Kannon Richards

State Director
Colorado State Office

APPENDIX A

COMMENTS ON DEIS

LIST OF COMMENT LETTERS AND TRANSCRIPTS OF PUBLIC HEARINGS

COMMENT LETTERS

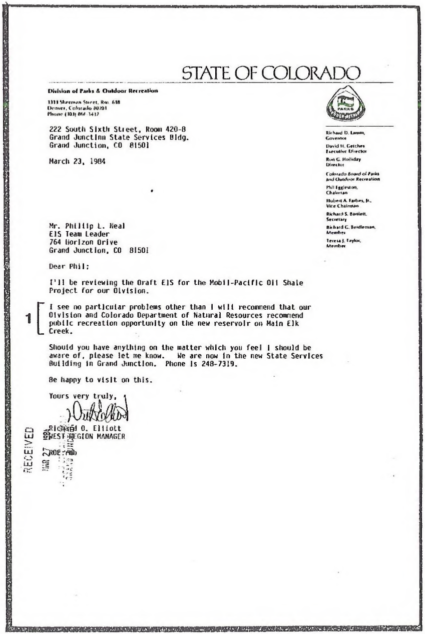
Page

State of Colorado Division of Parks & Outdoor Recreation A-1
Mesa County Policy and Research Office A-1
Friends of the Earth A-5
Earl and Donna Dawson A-7
Garfield County Board of County Commissioners A-7
U.S. Department of the Interior Fish and Wildlife Service A-9
The Colorado Mountain Club A-14
Mobil Alternative Energy Inc. A-15
Cleveland-Cliffs A-18
U.S. Department of the Interior Bureau of Reclamation A-21
Department of the Army Corps of Engineers A-23
Getty A-24
U.S. Department of the Interior National Park Service A-25
U.S. Department of the Interior National Park Service A-26
T. Peter Craven A-28
State of Colorado Department of Natural Resources A-28
State of Colorado Department of Natural Resources A-35
State of Colorado Department of Health A-36
U.S. Environmental Protection Agency A-37

TRANSCRIPTS OF PUBLIC HEARINGS

New Castle, Colorado A-43
Parachute, Colorado A-47
DeBeque, Colorado A-49
Grand Junction, Colorado A-56

(Responses to comments are in Appendix B. Response numbers in Appendix B correspond to the numbers indicated for comments in Appendix A.)



STATE OF COLORADO

Division of Parks & Outdoor Recreation

1313 Sherman Street, Rm. 618
Denver, Colorado 80203
Phone (303) 866-3437

Richard D. Lamm, Governor
David H. Getches, Executive Director
Ron G. Holliday, Director
Colorado Board of Parks and Outdoor Recreation
Phil Eggleston, Chairman
Hubert A. Farbes, Jr., Vice Chairman
Richard S. Bartlett, Secretary
Richard G. Beidleman, Member
Teresa J. Taylor, Member

222 South Sixth Street, Room 420-8
Grand Junction State Services Bldg.
Grand Junction, CO 81501

March 23, 1984

Mr. Phillip L. Neal
EIS Team Leader
764 Horizon Drive
Grand Junction, CO 81501

Dear Phil:

I'll be reviewing the Draft EIS for the Mobil-Pacific Oil Shale Project for our Division.

1 I see no particular problems other than I will recommend that our Division and Colorado Department of Natural Resources recommend public recreation opportunity on the new reservoir on Main Elk Creek.

Should you have anything on the matter which you feel I should be aware of, please let me know. We are now in the new State Services Building in Grand Junction. Phone is 248-7319.

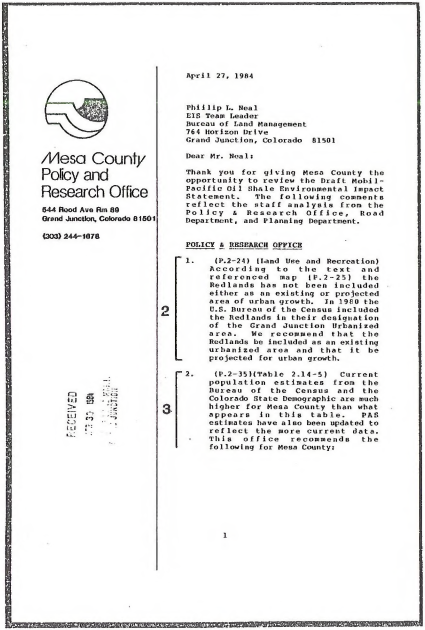
Be happy to visit on this.

Yours very truly,

Richard O. Elliott
WEST REGION MANAGER

ROE:mb

RECEIVED
MAR 27 1984
GRAND JUNCTION



Mesa County
Policy and
Research Office
544 Rood Ave Rm 89
Grand Junction, Colorado 81501
(303) 244-1678

April 27, 1984

Philip L. Neal
EIS Team Leader
Bureau of Land Management
764 Horizon Drive
Grand Junction, Colorado 81501

Dear Mr. Neal:

Thank you for giving Mesa County the opportunity to review the Draft Mobil-Pacific Oil Shale Environmental Impact Statement. The following comments reflect the staff analysis from the Policy & Research Office, Road Department, and Planning Department.

POLICY & RESEARCH OFFICE

2 1. (P.2-24) (Land Use and Recreation) According to the text and referenced map (P.2-25) the Redlands has not been included either as an existing or projected area of urban growth. In 1980 the U.S. Bureau of the Census included the Redlands in their designation of the Grand Junction Urbanized area. We recommend that the Redlands be included as an existing urbanized area and that it be projected for urban growth.

3 2. (P.2-35)(Table 2.14-5) Current population estimates from the Bureau of the Census and the Colorado State Demographic are much higher for Mesa County than what appears in this table. PAS estimates have also been updated to reflect the more current data. This office recommends the following for Mesa County:

RECEIVED
APR 30 1984
GRAND JUNCTION

3

	1981	1982	1983
Mesa County	89,009	94,381	92,784
Collbran	383	414	410
DeBeque	335	405	353
Fruita	3,102	3,300	3,252
Grand Junction	29,798	31,634	30,934
Palisade	1,767	1,985	1,911
Unincorporated	53,624	56,643	55,924

4 3. (P.2-41)(Table 2.14-8) The Central Orchard Mesa and East Orchard Mesa Rural Fire Dpartments have not been included in this table. We recommend that they be included as they are an integral part of the overall fire protection in the Grand Valley.

5 4. (P.2-42)(Table 2.14-9) To provide an equitable base to compare water systems, we recommend that facility capacities be standardized for all systems. (e.g. population, taps, MGD, etc.)

5. (P.2-45)(Table 2.14-10) Again we recommend that facility capacities be standardized.

6 6. (P.2-49)(School Districts) The statement on excess capacity for Mesa County School District #51 is misleading. Enrollments are geographically specific and should be considered by school and not cumulativity for the entire district. We recommend that School District #51 be contacted for specific data.

7 7. (P.2-52)(2.14.5.6 General Government) The joint City/County Development Department officially separated into two separate departments on January 1, 1984. We recommend that this change be noted.

8 8. (P.2-55)(Table 2.14-13) The population figures in this table do not equate to those on page 2-35.

9 9. (P.2-57)(Table 2.14-14) The data on Mesa County's 1982 budget appears to be incorrect. The outstanding debt on the sales tax bonds and its associated debt service has not been included in this table. We recommend that these items be included, or an explanation for their exclusion. Specific data is available from the Mesa County Finance Department.

10 10. (P.2-58)(2.14.6.4 Overall Fiscal Conditions) The paragraph on Mesa County's sales tax needs to be clarified. Of the two percent collected, only 22.5% is allocated to the County's general fund. The municipalities rceive 27.5% and the remaining 50% is used to repay general obligation bonds for capital improvements.

11 11. (P.3-131)(Residential Allocation of Work Force) Current monitoring of Union Oil's Phase I operations workforce shows that approximately 50% of the workforce lives in Mesa County. Since the Mobil project is adjacent to Union the basic assumption of resency patterns should be very similar. This difference of 30% in the operations workforce alone may have large long-range impact implications for Mesa County. We very strongly recommend that Mobil either rewrite this section on Socioeconomics, using a residential allocation of the workforce similar to that of Unin Oil's, or provide a satisfactory strategy for locating the majority of their workforce in Garfield County. Even with incentives to locate in Garfield County, half of the Union workforce has elected to reside in Mesa County. A satisfactory strategy would need to go beyond the strategies of Union Oil.

12 12. (P.3-141)(Table 3.3-14) This table only covers a portion of Mesa County. It is our considered opinion that this limited effort does not meet the scope of the EIS. On Page 2-28 it states that almost 25% of all scoping uses were related to socioeconomics; with population characteristics being among these issues. Also, Page 1-22 shows socioeconomics scoring over 57% more than the second most requested issue at the scoping hearings. All of the major population centers should be analyzed in this section to adequately meet the scope of this document. We recommend that, in addition to Mesa County and its five municipalities, that the other eight allocation areas for Mesa County found in PAS also be included in this analysis.

13. (P.3-145)(Table 3.3-15) Again, it is our opinion that this table and its associated analysis does not meet the scope of this EIS. Housing, as part of socioeconomics, was,indicated during the scoping process to be a significant issue. An analysis lacking specific geographical areas is considered to be incomplete. The housing mix and demand varies greatly across the Grand Valley. An analysis of all of the housing impacts in Mesa County cannot isolate specific problems in certain areas. Each of the allocation areas found in PAS should be used for this analysis.

10 14. (P.3-150)(Public Facilities, Services and Fiscal Impacts) The reference to Mesa County's share of the two percent sales tax is unclear. Please see comment #10, above.

12 15. (P.3-151)(Table 3.3-17) It is our considered opinion that this table and its associated text does not meet the scope of this EIS. This table does not, as its title implies, show the cumulative net fiscal impact. Only Mesa County and its five municipalities have been analyzed. None of the water, sewer, fire, or school districts have been

12 included. Therefore, this table does not represent the total impact of Mesa County since it does not include the fiscal impacts of these districts. This does not meet the scope of the socioeconomic issues raised during the scoping process. Page 2-28 lists these socioeconomic concerns. The lack of analysis of all the affected public services and facilities is substantial proof that the scope of this EIS has not been met.

16. (P.3-163) (Socioeconomic Conclussions) The conclussions reached in this section have been based on a series of analysis that in our opinion are incomplete (comment #'s 12,13, & 15). It is important to note that a change in the residential allocation of the workforce and a complete assessment of the fiscal impacts, may change these conclusions, especially for Mesa County.

15

17. (P.4-27)(Corridors) Paragraph 1502.21 of the CEQ regulations states that incorporation by reference is acceptable "...when the effect will be to cut down on bulk without impeding agency and public review...". It is our considered opinion that the description and analysis of the Roan Creek Corridor incorporated by reference from the CCSOP DEIS does not meet the intent of the CEQ regulations. The inclusion of the analysis portion of the corridor, which does not include the cumulative impacts of any project other than Chevron, effectively impedes agency and public review. The cumulative impacts of multiple projects using this corridor have not been addressed. It is acceptable to incorporate descriptions by reference, but not analysis.

18. (P.4-28) (Product Oil Pipeline) (Natural Gas Pipeline) The previous comment also applies to both of these sections.

19. (P.4-46) (4.1.2.9 Minerals Transport Alternative) Comment # 17 above also applies to this section. Either the cumulative impacts of an additional rail line or the cumulative effects of two companies using the same system must be analyzed.

20. (P.4-70) (4.3 Environmental Consequences) Comment #17 above also applies to this section.

16

21. (P.4-111) (Residential Allocation of Work Force) Current monitoring of Union Oil's Phase I operations workforce shows that approximately 50% of the workforce lives in Mesa County. Since the Pacific Project is much closer to Mesa County, the basic assumptions of residency patterns should be at least equal to Union's experience, if not more weighted to Mesa County. This difference in the operations workforce alone could have large long-range impact implications for Mesa County. We very strongly recommend that Pacific either rewrite this section on Socioeconomics uksing a more reasonable residential allocation of the workforce, or provide a satisfactory strategy for locating the majority of their workforce in Garfield County. Even with incentives to locate in Garfield County, half of the Union workforce has elected to reside in Mesa County. A satisfactory strategy would need to ge beyond the strategies of Union Oil.

17

22. (P.4-113) (Table 4.3-14) CITF is not a source of data for this table. Why has the Clifton CCD and the Redlands not been included? Both of these areas are Urban growth centers ,and both currently have many shale workers in residence. An entire re-evaluation of residency patterns within and without Mesa County is required.

12

23. (P.4-120) (Table 4.3-17) Comment # 12 above also applies to this section.

24. (P.4-124) (Table 4.3-18) Comment # 13 above also applies to this section.

25. (P.4-131) (Table 4.3-20) Comment # 15 above also applies to this section.

13

26. In both cases, consideration of personnel transportation is limited to on-site impacts. Mobil proposes a bus/funicular railroad system (p.3-33) running from a parking lot at the base of Cottonwood Gulch. Pacific proposes a bus shuttle system from a base parking lot to the project. (p. 4-29) Pacific projects an operations phase employment level of 3,400. At 1,100 per day shift, the DEIS assumes 20% would use "commercial" buses and auto occupancy rates would be 2.0. (p. 4-29) Even so, 450 cars could travel through DeBegue in one hour.

27. Neither project proposes mitigation measures. Separately, Mobil and Pacific conclude no severe impacts would result on the highway system. Cumulatively, the six projects noted page 5-1 would "...add pressure on the existing transportation systems..." (p. 5-28)

28. It would be reasonable to consider alternatives getting workers to the site. A peak hour demand of 450 cars may not, of itself, congest I-70 at DeBeque. It remains, however, a significant impact.

29. Specific consideration could be given to:

- Mass transportation from the residential areas.
- Vanpool/Carpool programs
- Incentives to workers who utilize mass transportation or vanpools.
- Park and Ride facilities in the residential areas.

These mitigative measures would not only decrease traffic

13 demand on I-70, but would assist in lowering air and noise pollution impacts.

ROAD DEPARTMENT

1. Due to the size and amount of traffic on the Roan Creek Road, we recommend that this road be upgraded to a class A loading with a minimum of three lanes.

PLANNING DEPARTMENT

The Draft Environmental Impact Statement prepared by Mobil-Pacific Shale Oil Project provides a great deal of useful information on the project and its impact on Mesa County.

The Mesa County Commissioners and Planning Commission were pleased with the response on the part of B.L.M. and Chevron in addressing major concerns and incorporating them into the Final E.I.S. last year, and we anticipate similar coooperation on the part of Mobil-Pacific.

The following items should be included or addressed in the following sections of the E.I.S.:

(Mitigation)
4.3.5.14 Socioeconomics (pp. 4-153, 4-156)

The worker housing strategies stated here are sound an in keeping with Mesa County Land use and Development Policies (adopted 1983) which encourage medium - high density growth where there is sufficient infrastructure (water, sewer, schools, parks, etc.).

We would suggest amplifying these statements to include the following:

14 1) Population for middle/upper management and general workforce should be encouraged to reside in existing urban and town centers where adequate infrastructure exists to support population impacts. Temporary housing and "man camps" should be used only for highly transitory workforce and should be located as close to the mine sites as possible. Mobil-Pacific should adopt a policy of encouraging its primary workforce (other than man camps) to reside in the urban area of Grand Junction, Palisade, Fruita, Parachute, Rifle, and Glenwood Springs. "Sprawl Growth" should be discouraged especially along the Roan Creek and I-70 corridors, and especially where such growth cannot be supported by water, sewer and other facilities and services.

2. Mohil-Pacific should contribute to a growth management program for Mesa County to give the County management tools to deal with boom/bust growth cycles.

3. Mesa County should be compensated for the discrepancy between revenue and population impact vis-a-vis Garfield County. While the revenue projections show a substantial property tax revenue for Garfield County, Mesa County will receive the bulk of the socio-economic impacts requiring new roads, schools, parks, etc.

4. Mesa County should be compensated immediately to help develop an economic development program to help mitigate the adverse impacts of boom-bust growth. Mobil-Pacific participation in the current Mesa County/Industrial Development Incorporated (IDI) economic development program would help address this issue.

5. Mobil-Pacific should participate in the town of DeBeque's Capital Improvement Program and Plan which was begun by Chevron. This will enable DeBeque to accommodate the major growth anticipated. Participation should be limited at this point to preparation and development of a capital improvement program to accommodate DeBeque's anticipated growth. At the beginning of the project, funds should be allocated in proportion to the impact of the project to help offset the costs of capital improvements.

14

4.3.1.15 Transportation

Specific commitments should be made towards development of a mass transit system from Grand Junction, Pruita, Palisade and DeBeque to the oil shale sites. Both oil companies should fund this transportation for their workers 100%. The use of "existing transportation facilities" is not a viable alternative in view of the projected workforce and the road conditions between Grand Junction and DeBeque.

4.3.5.8 Vegetation 4.3.5.11 Visual Resources

The "Mesa County Roadway Landscape Guidelines" should be used as a guideline for reclamation and landscaping all major roads in the project area, including Roan Creek Road and roads in the DeBeque area. (These guidelines are in a draft form as of this date, but are anticipated to be adopted within the next month - see attachment.)

Section 4

In the classification of impacts, mention of off-site land use impacts was noted in Chapters 2 and 4. The EIS points out correctly that agricultural operations are the predominant land use in the vicinity. It is notably dismissed, however, in 4-153 as an impact not recommended for mitigation. This is unsatisfactory. Determination of impacts on agricultural land uses in the area should be included, and mitigation strategies offered.

If you have any additional questions or concerns, please do not hesitate to call.

Sincerely,

Raymond J. Gronwall

Raymond J. Gronwall

RJC/ms

FRIENDS OF THE EARTH

New Address & Phone:
P.O. Box 728
Palisade, CO 81526
(303)464-5329

RECEIVED
APR 30 1984
BUREAU OF LAND MGMT
GRAND JUNCTION

Mr. Phil Neal
Bureau of Land Management
764 Horizon Dr.
Grand Junction, CO 81501

Dear Mr. Neal:

The following comments summarize the concerns of Friends of the Earth as presented at the April 19, 1984 public hearing on the Mobil-Pacific Draft Environmental Impact Statement. However, I request that both my oral and written comments be included in any record. Most comments are applicable to both projects.

18 Purpose & Need

The "need" for the projects was not justified; listing the necessary permits does not constitute a comprehensive treatment of need for the projects, or for the requests for excessive amounts of public lands.

19 Regional Setting

This entire section was poorly done. It is vague and inconsistent throughout. For example, it flip-flops between giving site-specific details to broad statements regarding the MIDDLE of the Piceance Basin, which is NOT where the Mobil and Pacific Projects are located.

20 Proposed Action & Alternatives

This section confirms our contention that the projects are highly speculative. The choices for technology include practically all of the major shale technologies, none of which have been proven on a commercial basis. The major objective of this draft EIS is to serve as a basis for gathering permits and public lands for the reservoirs and project sites. Consequently, the proposed action and the alternatives are very ill-developed. Many major alternatives aren't even considered (ie. different levels of barrel per day production) or are deleted with little or not explanation (e.g. water supply, materials handling, site locations.) The remaining alternatives are analyzed very scantily, often with such terminology as to whether or not they are "reasonable," whatever that means! The no action alternative merits a sentence or two, and the preferred alternative isn't even included, since it will supposedly make its appearance in the Final EIS, which is not typical of how EIS's are developed. Obviously, this Draft EIS does not even begin to meet NEPA requirements.

To exacerbate the difficulties encountered in evaluating this EIS, the maps and charts are very poorly done. Even though a great deal of public land would be utilized and/or affected by both projects, this is rarely pointed out, much less separated in the analysis, in terms of defining public resources or anticipated impacts on those resources. Overall, the entire EIS looks and reads like an EIS which was done to minimize both time and expense.

Colorado West Office, 530 Main St., Grand Junction, Colorado 81501, (303) 245-7047

21 A major weakness which underlines many of the deficiences in the Draft EIS, and an issue which is quite important in terms of specific impacts of shale projects, is the lack of a characterization study of the shale on the sites. Constituents in shale can be quite variable, which is one reason why site-specific analysis must be done. Secondly, since different technologies produce differing types of spent shale which present variable reclamation and pollution problems, some characterization needs to be done. Obviously, Mobil and Pacific didn't want to take the time to commission these tests. Therefore, the Draft EIS suffers greatly from vast gaps in knowledge regarding the shale resource, which in turns undermines the analysis of pollution issues, particularly in the areas of air pollution and spent shale disposal. The air pollution and spent shale sections border on the ludicrous in terms of their generality, so there was no point in having our volunteer experts attempt an analysis. The sections on water resources and quality aren't a great deal better; obviously there hasn't been much in the way of groundwater monitoring on the sites, so how can impacts be predicted or analyzed. We suggest that Mobil and Pacific go back and do their homework—do the type of studies and monitoring necessary to predict impacts—before attempting to go further in this EIS process. (Quoting other companies' studies or engineering reports is not sufficient.)

Affected Environment

Overall this section suffers from the same basic deficiency, lack of data,
22 which was analyzed above, so we won't repeat everything. However, we do note
the Mobil Reservoir is located over a fault; more information regarding the con-
sequences on fault movement and dam failure should be included. Both wildlife
23 and plant community impacts are not portrayed adequately. Naming the species,
but not giving numbers, ranges, and anticipated impacts doesn't constitute analy-
sis. The Pacific Section, in particular, nedds more extensive analysis of the
unique plant species on the site. Regarding air pollution and acid precipitation
we suggest you do a more thorough literature review; shale characterization, and
more extensive modelling.

Environmental Consequences

This entire section needs drastic overhauling to delineate the location, and the specific types and level of impacts, with further analysis of the short-term vis a vis long-term consequences. Claiming that construction of the Elk Creek Reservoir would cause annual reduction downstream, or that terrestial and aquatic habitat would be lost is stating the obvious; it does not constitute an analysis of environmental consequences. How much, where, what, and whom would be basic questions to answer in this section.

Environmental comparison of alternatives & Cumulative Impacts

24 Who are these "principal investigators" who followed the "Delphi" method? The
introduction, information, and placement of this section in the EIS is quite
23 confusing. The cumulative impacts section is hardly more than an outline
so we cannote comment on it except that it obviously needs real analysis and
expansion.

Much as we tire of reviewing oil shale EIS's we suggest that the Mobil-Pacific Draft EIS is so completely deficient that it virtually needs to be re-done. It doesn't even have the data of preliminary draft EIS's or environmental reports, so it cannot contain meaningful analysis and meet NEPA requirements.

Therefore, this draft EIS cannot be rectified in the usual manner of editing and/or revising some sections, and responding to public comments by code numbers in a Final EIS. We urge the Bureau of Land Management, and Mobil and Pacific to start over, do the necessary studies and surveys, and then publish a new Draft EIS.

Sincerely,

Connie Albrecht

Connie Albrecht
Colorado West Representative

CC: Colorado Joint Review Procses
Environmental Protection Agency
Army Corps of Engineers
U.S. Fish & Wildlife Service

Earl and Donna Dawson
0950 Rd. 243,
New Castle, Colorado 81647
April 27, 1984

United States Department of the Interior
Bureau of Land Management
Grand Junction District
764 Horizon Drive
Grand Junction, Colorado 81501
Att'n Mr. Dick Freel

Re: Draft
Mobil-Pacific Oil Shale
Environmental Impact Statement

Dear Mr. Freel:

25 In regard to your E.I.S. draft concerning Mobil Oils proposal to build a reservoir on Main Elk Creek, four miles north of New Castle, Garfield County, Colorado; Earl and Donna Dawson of County Road 243, New Castle, Colorado, Main Elk Creek, have these concerns and request that they be identified in the final Draft of the E.I.S. Also that all permitting agencies shall receive a written notice of the false statement and map correction, regarding Mobil Oil owning and managing all the land to be inundated by this project.

We feel due to the fact that Mobil Oil has no Oil Shale plant, that public and private land will be disturbed and inundated, our home destroyed, the habitat of numerous species of wildlife lost, the danger of life in case of dam failure and that the project appears for Mobil Oil Corporation's gain only, that any and all permits should be denied.

Sincerely,

Earl E. Dawson

Earl E. Dawson

Donna A. Dawson

Donna A. Dawson

Ref. Mobil Oil-Pacific Shale E.I.S.
page. 3-81, False Statements
page. 1-4, map, false enclosure boundry
cc. Inspector General, Dept of The Interior
Mr. Robert Burford, Bureau of Land Management, Dept. of Int.
Mr. Bob Moore, Acting State Director, B.L.M.

GARFIELD
COUNTY **Board of County Commissioners**

FLAVEN J. CERISE
District I, Carbondale 81623
LARRY VELASQUEZ
District II, Glenwood Springs 81601
EUGENE (JIM) DRINKHOUSE
District III, Rifle 81650

COMMISSIONERS ANNEX
201 8th Street P. O. Box 640
Glenwood Springs, Colorado 81602
Telephone: (303) 945-9158

S. R. (STAN) BROOME
County Manager

April 30, 1984

Phillip L. Neal
EIS Team Leader
Bureau of Land Management
764 Horizon Drive
Grand Junction, CO 80501

Re: Draft Mobil-Pacific Oil Shale Environmental Impact Statement

Dear Mr. Neal:

The Garfield County Board of County Commissioners appreciates the opportunity to submit comments on the above captioned DEIS. In general the information on both projects appears to be adequate for EIS purposes, but will not suffice for County land use permitting processes.

There are some issues that the Board feels need to be either corrected or clarified as noted in the following comments:

27 Page 1-3, Figure 1.0-1 - The main Elk Creek Road is County Road 245 and the Parachute Creek Road is County Road 215.

26 Page 1-4, Figure 1.2.1 - While it is a small parcel, there is a privately owned parcel within the property boundary of the Mobil property. As a note, Garfield County will require the consent of all landowners subject to inundation before any land use permit applications will be accepted.

27 Page 2-51, 2.14.5.5, Public Health - The Garfield County Public Health Department is not responsible for environmental health. The environmental health functions are included in the responsibilities of the Department of Development.

Page 2-53, 2.14.5.7, Airports - The Garfield County Airport at Rifle does not have any commuter connections to Aspen and Denver.

28 Page 2-56, 2.14.6.1, Sales and Use Taxes - Garfield County has a .25 percent sales tax, not .58 percent.

29 Page 3-45, 3.1.2.6, Water Supply - The use of Ruedi Reservoir water should be explained more fully, such as the amount Mobil may be able to purchase and the effect that purchase could have on the size of the Elk Creek Dam.

Page Two

30 Page 3-56, 3.2.4 - Soils suitability for wastewater disposal should be explored.

31 Page 3-99, 3.3.1.5, Waste Disposal - Further explanation of the processed shale compaction density would be appropriete, along with further explanation of the leachate control system.

32 Page 3-143, 3.3.1.14, Housing - The location of the proposed man-camp is critical to the housing consequences evaluation and should be determined now.

33 Page 3-164, 3.3.1.15, Roads and highway impacts - Impacts to County Road 245 needs to be evaluated, particulerly during the construction phase of the reservoir.

34 Page 4-110, 4.3.1.14, Socioeconomics - All CITF attributions in this section are inappropriate since Pacific is not a member of CITF.

35 Page 4-122 and Page 4-154 - Both pages note construction camp sizes, one states a maximum of 680 workers, while the other states a maximum size of 1500 workers.

In addition to the above more specific comments, the Board would like to make the following general comments:

36
1. As noted in the introduction to the mitigation sections, the BLM has no authority to require mitigative measures on private lands. The mitigation measures proposed are generally adequate for EIS purposes but will not be sufficient for County land use permitting purposes.
2. Overall, the effort to identify cummulative impacts is appreciated, but the conclusions drawn are very weak and should not be considered sufficient to answer the questions related to cummulative impacts.

Again, we thank you for the opportunity to comment on this DEIS, and look forward to further communication and coordination on similiar issues.

Sincerely,

Larry Velasquez
Chairman

LV/emh

CITIES SERVICE OIL AND GAS CORPORATION
PLANNING AND DEVELOPMENT
BOX 300
TULSA, OKLAHOMA 74102

April 30, 1984

RECEIVED
MAY -2 1984
GRAND JUNCTION

J. HULSEBOS
MANAGER
OIL SHALE AND COAL

Mr. Phillip L. Neal
Mobil-Pacific EIS Team Leader
Bureau of Land Management
764 Horizon Drive
Grand Junction, CO 81501

Dear Mr. Neal:

37

Cities Service Oil and Gas Corporation (Cities) has reviewed the Draft Environmental Impact Statement (DEIS) for the Parachute Shale Oil (Mobil) and the Pacific Shale (Pacific) Projects and offers the following comments and suggestions:

1. The Final Environmental Impact Statement (FEIS) should note that the east boundary of the Pacific project area as shown in several figures, including Figure 4.1-2, is the mineral ownership boundary which is not consistent with surface ownership.
2. The DEIS places some Pacific facilities on surface owned in fee by Cities, such as:
    - a. A portion of the alternative spent shale disposal facilities shown in Figures 4.1-17 and 4.1-20;
    - b The access road alternative shown in Figure 4.1-21;
    - c. Possibly the Exhaust Adits 5 and 7 in the proposed action, as shown in Figure 4.1-5;
    - d. Possibly the access entry to the east of Exhaust Adit 6 in the proposed action, as shown in Figure 4.1-5.

If the preferred action utilizes surface owned in fee by Cities, the FEIS should state that fact. It goes without saying that the project proponent(s) will have to negotiate with Cities mutually satisfactory arrangements for the use of this surface.

Yours truly,

J. Hulsebos

kb

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
COLORADO FIELD OFFICE
730 SIMMS STREET, SUITE 292
GOLDEN, COLORADO 80401

May 1, 1984

RECEIVED

MEMORANDUM

To: Bureau of Land Management
Att: EIS Team Leader (Mobil-Pacific EIS)
Grand Junction, CO

From: Asst. Field Supervisor - Colorado
Ecological Services

Subject: Review of Mobil-Pacific DEIS

Subject to your notice, we have completed our review of the Mobil and Pacific draft environmental impact statement.

GENERAL COMMENTS

We commented on the Preliminary Draft EIS by letter dated November 18, 1983. We note that many of our comments went unheeded. Those comments which we believe were important but unanswered are again reiterated in this Draft EIS Review. We believe that the comments and questions presented here are important and need to be given serious consideration for response in, or modification of the Final EIS.

38 The EIS briefly discusses the majority of the fish and wildlife impacts associated with the projects. Our primary concern is the lack of commitment to mitigation measures which would serve to reduce these losses. Additionally, there are some important mitigation features which need to be included. The mitigation section however, is much improved from the first review. Commitment to, or the probability or fulfillment of mitigation measures is required in the EIS by regulation and must be included in the final EIS to ensure its adequacy. We believe that the inclusion of commitments to mitigation is essential if wildlife impacts are to be characterized accurately.

39 We also question why the impact analysis we provided on December 5, 1983 was not included in this DEIS. We believe this analysis more accurately portrayed the fish and wildlife impacts of the various alternatives than does the Delphi System which was used.

40 There are a number of project features which have been detailed in previous EIS's which will be shared by several oil shale companies. It is important that the fish and wildlife impacts for these jointly shared corridors, reservoirs, roads, etc., be

40 mitigated for by those companies which ultimately build the project. Our concern is that each company will place the burden of these shared features on the other.

ENDANGERED SPECIES COMMENTS

41 FWS is presently conducting formal Section 7 consultation under the Endangered Species Act (ESA) with BLM on the Parachute Shale Oil Project (FWS consultation File Number 6-5-84-0007). The final biological opinion from FWS to BLM is expected to be issued on or before September 30, 1984.

A "No Jeopardy" Biological Opinion or "Jeopardy" Biological Opinon, in which reasonable and prudent alternatives are agreed to, should precede Federal approvals for development of Mobil's Parachute Shale Oil Project.

SPECIFIC COMMENTS

42 Page 1-23, fourth paragraph. We believe that the effects of oil shale operations on Federal lease tracts CA and CB should be included in the low development scenario. There has been considerable commitments of resources to these projects and it is reasonable to expect commercial development.

Page 1-23, fifth paragraph. We believe that all proposed and ongoing oil shale projects should be assessed under the cumulative impact analysis. This should include in addition to the projects listed: Gary Refinery, Moon Lake power generation, Getty Shale Oil Project (100,000 bpd), Cities Shale Oil Project (100,000 bpd), Rio Blanco Oil Shale (CA) (100,000 bpd), Cathedral Bluffs (CB) (50,000 bpd), White River Shale Oil Corp. (UA/UB) (114,000 bpd), Naval Oil Shale Reserve (50,000 bpd), Geokinetics (73,000 bpd), Parahoe Ute (42,000 bpd), Tosco Sand Wash (48,000 bpd), Magic Circle (31,500 bpd), and Syntana-Utah (50,000 bpd). All of these projects either have considerable commitment or EIS's completed or in later stages than the Mobil Pacific EIS. Therefore, they fit the evaluation criterion used in the EIS to determine projects which should be included in the high development scenario.

43 Page 2-21, Table 2.B-1. We were pleased to note that you included a listing of the Special Status plant species of the region. It is important tht these species be provided the maximum protection available as they may, as you noted in the EIS, be listed as federally-endangered species in the future. You note on Page 3-113 that 37 acres of potential habitat for special status species would be disturbed during construction and 184 acres would be destroyed during operation. We agree very strongly with your proposal for mitigation on Page 3-174 that the areas should be avoided whenever possible and that other techniques should be used on those areas which cannot be avoided.

44 Page 2-22, second paragraph. The bird species listed as being of

44 interest are actually birds of high federal interest. This list of birds, which was developed for the region to analyze the impact of coal mining, is very applicable to oil shale. Of the species listed, all except the ferruginous hawk should be evaluated for the impacts oil shale developments might have on them. The ferruginous hawk would probably not be found in the areas associated with either of these projects.

45 Page 2-24, Land Use. Another important land use in the region is wildlife habitat. This use is important both historically and presently and is an important consideration in reclamation goals. Consideration for the land's ability to serve as wildlife habitat (not merely as recreation) should be included in the FEIS.

46 Page 3-1, fourth paragraph. The use of coal and the production of coke in tha upgrading process is rather vague. .The coal requirements of this process and the process itself should be explained in more detail. The impacts of coal production for the oil shale industry should be considered in the cumulative impacts section. What are the environmental impacts of the coking process?

47 Page 3-18, third paragraph. Is there evidence to support the statement that compacted shale would be impervious to water seepage?

48 Page 3-24, second paragraph. What is the water quality expected for use in shale quenching? Are polynuclear aromatic hydrocarbons formed by retorting completely destroyed by steam stripping? Is treated sour water toxic? These questions should also be addressed for the Pacific project.

49 Page 3-24, seventh paragraph. What is the chemical nature of the spent catalysts that will be disposed of as hazardous waste? Do the leakproof containers for storage of hazardous waste include open pits? What kind of storage facilities and safety precautions are anticipated?

Page 3-25, seventh paragraph. The use of a multilevel intake structure on the dam to provide aquatic enhancement downstream is an excellent mitigation measure. This should be mentioned in the mitigation section later in the document.

59 Page 3-27, seventh paragraph. We are opposed to the use of an overflow weir as it creates an obstruction to fish migration and recreation. The two alternatives proposed which do not utilize a weir structure and would provide much less impact to the aquatic environment are preferred from an environmental view.

Page 3-33, second paragraph. The funincular railroad should have a limited impact on wildlife and therefore we strongly support its construction and use in place of busing.

50 Page 3-45, fifth paragraph. What are the chemical characteristics of

50 hazardous waste produced by the projects? What are these wastes?

51 Page 3-46, first paragraph. It is noted that: "Mobil is presently pursuing a water service contract with the Bureau of Reclamation for purchase of Ruedi water..."

It should be noted that the Record of Decision for the Ruedi Reservoir Water Marketing Program, dated June 23, 1983, states: "Each contractor of Ruedi Reservoir water will be responsible for any National Environmental Policy Act compliance documents in addition to the supplement to the Final Environmental Statement for the Fryingpan-Arkansas Project required because of the diversion and/or use of the water provided."

If Mobil is seriously considering Ruedi water, consideration should be given to meeting NEPA requirements through this EIS to avoid the need for a supplemental EIS.

This comment may also be appropriate for the Pacific project. It is noted they may receive water from a Federal reservoir.

52 Page 3-71, fourth paragraph. Why aren't the other species as listed in Table 2.8-1 included here as well? These special status species, even though not proposed for federal listing, deserve consideration.

53 Page 3-75, third paragraph. A bald eagle nest was discussed in the baseline associated with the reservoir; however, the only discussion here was that bald eagles have been seen hunting in the reservoir vicinity. This nest could be very important and needs to be evaluated as a real possibility. In addition, this area may be a possible bald eagle winter roosting area and needs to be evaluated as such. We suggest that prior to issuance of any right-of-way applications, additional surveys be performed to determine the actual bald eagle use of this area.

Page 3-110, third paragraph. The use of BACT, which includes traveling screens and intake velocities less than 0.5 foot per second, is an excellent mitigation measure which will help to reduce the impact to the aquatic resources of the river.

54 Page 3-112, fourth paragraph. Our (GIS) Geographic Information System evaluated the project in a different manner. For this reason we take exception with the determination that all the areas you have listed in this paragraph are of limited importance. The vegetation is often only as important as the wildlife which uses it (except threatened, endangered or sensitive plant species or other important plant communities as defined in EIS's following paragraph. For this reason, many of these plant species which provide big game with critical winter habitat and are classified here as of limited importance are really of extreme importance to big game and need to be classified as such. For a much more complete evaluation of habitat and vegetation and its importance to wildlife, please see our impact analysis letter dated December 5, 1983, which was provided prior to the

54 development of this DEIS.

55 Page 3-113, second paragraph. We agree with the comment that the loss of 60 percent of the riparian habitat within the project site would be one of the greetest impacts to the plant community. The FWS mitigetion policy classifies this riperien hebitat as a Category 2 habitat type which is scarce and rapidly declining and bence should be mitigated for no net loss of in-kind habitat value. This is a very important issue which needs to be addressed in the mitigation section of the EIS.

Page 3-108 thru 3-116. These sections portray a number of the impacts to fish, wildlife and vegetation; however, we believe the mitigetion section as outlined on Pages 3-173 to 3-175 does not offset these losses. Of primary concern is the lack of any mitigetion directly related to replacement of habitate loet. We have clessified, as outlined in the FWS mitigation policy, three different habitat/renge types which need to be avoided, acquired, and/or enhanced in our technical assistance letter dated December 5, 1983.

Page 3-170, fifth paragraph. If all mitigation is uncommitted, how can the document be used to eatisfy NEPA requirements regerding impacts? We believe it is imperative that wildlife mitigation be committed to prior to issuence of the final document.

56 Pege 3-173, Aquatic Ecology. We believe the mitigation provided in this section ia good. However, in our letter dated December 5, 1983, we included other mitigation measuree which we believe need to be included to offset the impects to the aquatic ecology. The following represents our comments and other mitigetion we believe is necesssry.

First paragraph. These regulations need to be coordinated with the Colorado Diviaion of Wildlifs (CDOH).

55 Second paragraph. In addition, public access needs to be allowed to utilize the fishery wbich will develop below the reservoir.

Third paragraph. The FWS is opposed to the construction of e diversion dam and advocates the construction of a center of the stream intake crib as proposed in the alternatives.

57 Fourth paragraph. Page 3-110 discussed the use of treveling screens and inteke velocities of less than 0.5 foot per second. These are both excellent mitigation measures and need to be included here.

55 Fifth peragraph. In addition to utilizing the reservoir, a tail water fishery could be developed below the reservoir. Since Mobil intends to utilize a multilevel intake structure (Page 3-25), excellent water quelity should be provided below the reservoir for e high quelity fishery. There would elso be a need to provide public access for this fishery. This together with the reservoir fishery would help to provide a greater portion of the proposed shortfsll in available fish and fishing trips for the area.

55 Page 3-174, Vegetation. In our letter dated December 5, 1984, Impact Analysis and Mitigation Recommendations, we addressed the issue of unique and irreplaceeble habitats (Category 1). These areas need to be avoided. However, if it is impossible to avoid these areas, some type of mitigetion would need to be developed. The proposal to research different possibilities is good and we would like to be consulted and involved in that process.

Page 3-174/175, Wildlife. Of primary concern is the lack of any mitigation directly related to the loss of Category 2 and 3 habitat/ranges. In our letter dated December 5, 1983, we outlined mitigation measures which we believe are necessary to offset the losses directly related to the two oil shale projects. Unfortunately, some of our major mitigation was never addressed in this document. We believe that it is imperative that Category 2 and 3 hebitet/ranges as defined in the FWS mitigetion policy be mitigated for. In our December letter, we suggested how this could be done. To reiterate this, we suggest that a mutually agreeable means be developed by the BLM, Mobil, CDOW and FWS to determine habitet velue of potentielly effected lands end non-affected lands which would be acquired and enhanced or enhanced to offset the project impacts. Some enhancement measures which may be used include those listed in the first peragraph on Page 3-175.

In addition to the mitigation listed ebove and under wildlife in the EIS, we believe the following items should be included:

1. No activity will occur within a 1/2 mile buffer zone of any occupied or active raptor nest except as spproved by FWS and CDOW.
2. No destruction of raptor nests will occur except as specificelly permitted by FWS and CDOH.
3. Project proponents should contribute to development of a regional wildlife management plan.
4. Reclamation for wildlife will be a principal prority in the finel decommissioning of the two shale oil projects.
5. Restore at a minimum the premining level of interspersion of shrub, grassland, and forest cover in consultation with BLM, FWS and CDOW.
6. Monitor bald eagle roost sites and nest locations in reservoir vicinity. Allow construction only during periods which would not adversely affect bald eagles.

58 Page 3-180/186. We believe the system used by Danes and Moore is more suggestive than the system used by the FWS for wildlife impact assessment. The information we provided (December 5, 1983) should be used to compare alternatives from a fish and wildlife perspective.

59 Page 3-190, second paragraph. We disagree with the statement that the side channel intake alternative would be environmentally most favorable. Larval fishes tend to move and congregate near the shore. This being the case, a center of the stream intake would have the least impact on the aquatic environment of the river.

60 Page 3-190, fourth paragraph. The small amount of sediment that would be trapped behind the weir would have no negligible impact on the Colorado River. In addition, one spring runoff period would probably completely silt in the area above the weir so that any subsequent sediment would continue to move downstream.

61 Page 3-191, Contractors Road. Our impact analysis showed the Mahaffey Ranch road to have the least fish and wildlife impacts if you consider all of the roads equally i.e., new construction.

Page 3-193, Utility Corridor. Our impact analysis showed Cottonwood Gulch corridor to disturb slightly more acreage. However, overall impact to fish and wildlife on the Cottonwood Gulch corridor was evaluated as only one-third that of Whealer Gulch.

62 Page 4-20. What is the chemical composition of the spent catalysts that will be disposed of as hazardous waste? Where would the onsite hazardous waste landfill be located? What hazardous waste storage and disposal systems are anticipated?

55 Page 4-60 thru 4-64. These sections portray a number of the impacts to fish, wildlife and vegetation; however, we believe the mitigation section as outlined on Pages 4-150 to 4-152 does not offset these losses. Of primary concern is the lack of any mitigation directly related to replacement of habitats lost. We have classified, as outlined in the FWS mitigation policy, three different habitat/range types which need to be avoided, acquired, and/or enhanced in our technical assistance letter dated December 5, 1983.

63 Page 4-60/61, Aquatic Ecology. There should be a discussion on the flow reductions (primary and secondary) and the impacts of those reductions on the aquatic resources.

64 Page 4-94, fourth paragraph. There is no discussion concerning ways to eliminate or reduce the possibility of impingement and/or entrainment. Mobil proposed traveling screens with intakes of 3/8 inch. This would help to reduce the aquatic impact. Impacts of 2.0 feet per second would cause severe impacts to fishes in and around the intakes and we therefore strongly oppose any intakes that would have intake velocities greater than .5 foot per second.

54 Page 4-98, first paragraph. As stated before, see comments for Page 3-112. We disagree with stating that all of these plant species are of limited importance.

65 Page 4-148, first paragraph. See comments for Page 3-170. We strongly disagree with this statement. We believe BLM has the authority to authorize mitigation on all lands administered under this EIS process which affect public resources. In addition, these mitigation proposals must be committed to prior to issuance of the final document.

55 Page 4-150/151, Aquatic Ecology. The DEIS suggests that Pacific could provide this additional fishery resource. Will this occur? It may be appropriate for the oil shale companies to jointly provide either the funding or participate in the development of a new hatchery to mitigate this loss. However, we are curious how Pacific intends to mitigate for this loss. Special regulations are an excellent mitigation measure; however, we would suggest that a statement be added that would coordinate any efforts with the Colorado Division of Wildlife. Designed intake velocities should not exceed .5 foot per second.

Page 4-151, Vegetation. In our letter dated December 5, 1984, Impact Analysis and Mitigation Recommendations, we addressed the issue of unique and irreplaceable habitats (Category 1). These areas need to be avoided. However, if it is impossible to avoid these areas, some type of mitigation would need to be worked out. Your proposal to research different possibilities is good and we would like to be consulted and involved in that process.

Page 4-151/152, Wildlife. Of primary concern is the lack of any mitigation directly related to the loss of Category 2 and 3 habitat/ranges. In our letter dated December 5, 1983, we outlined mitigation measures which we believed were necessary to offset the losses directly related to the two oil shale projects. Unfortunately, some of our major mitigation was never addressed in this document. We believe that it is imperative that Category 2 and 3 habitat/ranges as defined in the FWS mitigation policy be mitigated for. In our December letter, we suggested that a mutually agreeable means be developed by the BLM, Pacific, CDOW and FWS to determine habitat value of potentially affected lands. Then a determination can be made of the actual acreages of non-affecting lands that need to be acquired and enhanced or enhanced to offset the project impacts. Some enhancement measures which may be used include those listed in the first paragraph on Page 3-175.

In addition to the mitigation listed above and under wildlife in the EIS, we believe the following items should be included as well:

1. No activity will occur within a 1/2 mile buffer zone of any occupied or active raptor nest except as approved by FWS and CDOW.
2. No destruction of raptor nests will occur except as specifically permitted by FWS and CDOW.
3. Project proponents should contribute to development of a regional

55 wildlife management plan.

4. Reclamation for wildlife shall be a principal priority in the final decommissioning of the two shale oil projects.

5. Restore at a minimum premining level of interespersion of shrub, grassland, and forest cover in consultation with BLM, FWS and CDOW.

58 Page 4-156-162. Refer to our specific comment for 3-180 and 3-186.

66 Page 4-160, Plant Site Location. Our wildlife impact analysis showed the plant site in Deer Park Gulch and Scott Gulch to be preferred from a fish and wildlife view. However, our analysis showed the impacts of each of the alternatives to be similar enough that fish and wildlife should probably not weigh that heavily on the selection.

67 Page 4-161, Table 4.4-1. In reviewing the "environmental evaluation of alternatives," we question its actual merit and reliability. It is a very subjective means of comparing individual project components. One project which was evaluated (under water supply) was the GCC reservoir. We noted it received a high rating for land use and recreation. To our knowledge, there has been no commitment from the project proponents to provide a fishery or public access to this reservoir. This being the case, how can it receive such a high value under this category? In addition, there was no evaluation of the project's adverse impacts on vegetation or wildlife which will be significant. This makes us even more skeptical of this environmental evaluation.

68 Page 4-168, Water Intake Facility. It appears that the intake velocity was misstated as "20 cubic feet per second"?. However, we would agree that an intake velocity of .5 foot per second or less would be preferred.

42 Page 5-1, second paragraph. The DEIS states that the high development scenario utilized "future oil developments which would be situated within the probable environmental impact area of Mobil and Pacific projects and for which there was sufficient information available from EIS's to evaluate the impacts." We question why none of the oil shale projects we listed in our comments on Page 1-23 were not included. The analysis should have at least included: Rio Blanco Oil Shale (CA) (100,000 bpd); Cathedral Bluffs (CB) (50,000 bpd); Naval Oil Shale Reserve (50,000 bpd); Getty Shale Oil Project (100,000 bpd); and Cities Shale Oil Project (100,000 bpd). In addition, Gary Refinery, a current operating refinery in the Grand Valley, should be included in this scenario. In our comments on Page 1-23, we included additional oil shale projects within the area which would have a cumulative impact on the region. As these are reasonably forseeable future actions under the CEQ regulations, we ask that they be included in the FEIS analysis.

69 Page 5-12. The estimates of the the oil shale industries contribution to the Colorado River salinity problem, measured at Imperial Dam, are low. The Mobil/Pacific estimate is only 5 to 5.5 mg/l; but by their own estimtes, the Getty, Chevron, ad Cities Service projects (GCC) alone account for 4.8 mg/l. Adding Mobil (.932 mg/l), Pacific (1.66 mg/l), and Union (around 1.1 mg/l) gives about 8.5 mg/l, not including the two other projects mentioned on Page 5-12. Each additional milligram per liter salinity increase at Imperial Dam represents $540,000 (indexed to 1/1/83) of damages to water users (Mancos Valley Salinity Control Study, 1984).

70 Although both Mobil and Pacific will be producing 100,000 barrels of shale oil per day, Mobil will require only 70 percent as much water as the Pacific project. We would like to know the reason for the difference. This reduction of water use allows Mobil's contribution to the Colorado River salinity problem (as measured at Imperial Dam) to be only 56 percent that of the Pacific project. Is Mobil's water utilization 30 percent more efficient?

71 Page 5-15, third paragraph. Generally wildlife are not displaced to other areas due to the loss of habitat. In most cases, wildlife are at carrying capacity and those displaced animals are lost. Only if the habitat is adequately improved on adjoining areas can wildlife carrying capacities be increased. We would agree that significant development will drastically reduce the amount of available habitat. However, we do not agree that only one project would affect wildlife only by displacing them to adjoining areas while multiple facilities could eliminate habitat capable of supporting increased densities.

SUMMARY

Of primary concern is the lack of commitment to the fish and wildlife mitigation listed. In addition, we hope that our additional mitigation recommendations are included as a portion of the final EIS. Inclusion of these additional mitigation features and commitment to mitigation is essential if wildlife are to be adequately mitigated for. We believe that the recent meetings (April 13 and 26, 1984) of BLM and FWS staff show strong indications that the completion of essential mitigation features can be assured by the inclusion of mutually agreed upon terms and conditions. To this end, the FEIS should clearly identify both committed and required mitigation features for both projects.

We intend to continue to work with BLM and the project proponents to develop an EIS which adequately addresses the impacts to fish and wildlife and provides adequate committed mitigation to reduce adverse impacts from the development and operation of these projects to acceptable levels.

L. Ronel Finley

cc: BLM, State Office
CDOW, Grand Junction; Denver
Mobil Oil Corporation
Cliffs Engineering, Inc. (Attn: Truman Louderback)
CE, Sacramento
EPA, Denver (Attn: Rick Claget)
FWS/HR, Denver; SLC; Grand Junction

The Colorado Mountain Club
GROUPS: ASPEN • BOULDER • DENVER • DENVER JUNIOR • DENVER WILDERNESS KIDS • EL PUEBLO
ENOS MILLS • FORT COLLINS • LONGS PEAK • PIKES PEAK • SAN JUAN • WESTERN SLOPE
TELEPHONE
922-8315
2530 WEST ALAMEDA
DENVER, COLORADO 80219
OFFICE HOURS MONDAY THRU FRIDAY 9 A.M. to 2 P.M. AND MONDAY, TUESDAY AND THURSDAY EVENINGS 7 TO 9 P.M.

Phillip L. Neal
EIS Team Leader
BLM
764 Horizon Drive
Grand Junction, CO. 81501

May 3, 1984

Dear Mr. Neal,

The Colorado Mountain Club is a state-wide recreational and conservation organization of over 7,700 members. Our members take many Club and individual trips into the Colorado high country during all seasons of the year. We are particularly concerned that the Mobil and Pacific proposed developments not adversely affect the pristine air quality, excellent visibility and existing Ph of Colorado's National Wilderness areas and the high country in general. Following are comments on the Mobil-Pacific Oil Shale DEIS.

72 1) The Colorado Mountain Club regrets that the BLM did not hold a public hearing on the DEIS in the Denver area. While the proposed projects are located near Parachute, there could be long range impacts in popular Wilderness and National Forests in the state. There are many users of these areas living along the Front Range. We hope that BLM recognizes that as far as air quality and acid deposition impacts are concerned, these are state-wide and national issues because of the importance of the areas which could be affected.

2) The information in the EIS regarding retort processes and emission information for each project is extremely vague and general. The Mobile proposal includes Tosco II, Union B and Paraho DH processes as well as consideration of the Chevron STB, Lurgi and circular grate processes. In sections 3.3.1.1 (Mobile) and 4.3.1.1 (Pacific) the document states that: a) there are no comparable oil shale processing facilities from which to monitor emissions; b) the effectiveness of emission control technology has not been firmly established. Given the uncertainity over retort technology and the lack of comparative emission data, the DEIS can not accurately reflect air quality impacts from the proposed projects.

73 The Colorado Mountain Club believes that air quality impacts are serious long-term environmental impacts and must be included with a high degree of accuracy in any oil shale EIS. We therefore request that BLM, in its decision notice, require an air quality supplement to the EIS before any permits are issued. BLM would do well to question whether reclamation, water quality and quantity, land use and wildlife impacts can be accurately assessed given the uncertainity over the type of retorting technology to be used.

3) The description of the results of the Delphi process at the end of Chapters 3 (Mobile) and 4 (Pacific) illustrate the difficulties of assessment when the technology of a proposed development is uncertain. Section 3.4.3.1 (Mobile) states "based on existing information, no environmentally preferred method or combination of methods can be identified." Since retort technology is basic to oil shale development, there is question as to whether NEPA requirements can be met if the proposal is not clear.

Phillip L. Neal
- 5/3/84
- 2 -

74 4) The third paragraph on page 5-2 states that TAPAS trajectories are steered to the south of the Flat Tops Wilderness while the Complex I has the plume centerline moving directly at the Flat Tops. Figure 5.5-2, page 5-90, shows a plume from the Mobile site crossing the northwest edge of Flattops and moving over Steamboat Springs up into the Zirkel Wilderness. This figure is described as a Tapap Model Plume Trajectory. Please clarify this.c

5) We are suprised that projected air quality impacts from the proposed developments and from the cumulative analysis are so low. The conclusions reached in this EIS are not consistent with the Chevron EIS or with the Getty/Cities Service DEIS. The Colorado Mountain Club is pleased that the projected impacts are so low, but we frankly wonder about the accuracy of the assessment. It is our understanding that the TAPAS model has been refined. To the best of our knowledge, there is no discussion in the DEIS as to how it has been refined. This would give the public an opportunity to judge the accuracy of the emission projections. There should be a clear discussion in the document as to the modeling techniques and changes from previous EISs.

6) The acid deposition levels are very low in the projected impacts. We are aware that changes in Ph, consistent changes, have been measured at Mexican Cut near Crested Butte and in the Indian Peaks near Boulder. These changes have occurred even though there are no near-by heavy industrial sources. It is hard to believe that the high-level scenario would not produce measurable changes in the Flattops and maybe even the Zirkel Wildernesses. Page 5-92 states that wet sulfate deposition of less that 20 kg/HA-yr have not produced recorded damage in the most vulnerable areas. The supporting reference , Roberts, Jl, 1983, does not appear to be a technical paper. This is a major assumption and needs more scientific support.

It is important for BLM and the oil shale industry to understand that those of us who use Colorado's natural recreational resources DO NOT WANT TO WAIT UNTIL THERE IS RECORDED DAMAGE IN THE MOST VULNERABLE AREAS. We believe that controls can be applied that will prevent the threshhold of recorded damage being reached. The first paragraph on page 5-92 is a misstatement of the issue and does not belong in an EIS under the guise of scientific data.

7) The EIS indicates that modeling for secondary pollutant impacts has been done at Rifle, DeBeque, Parachute and Grand Junction. The Colorado Mountain Club requests that modeling and monitoring be done for major recreation areas which could be impacted. These areas include Rifle Gap State Park, the Powderhorn, Sunlight and Beaver Creek Ski areas and the area around Steamboat Springs, possibility Steamboat Ski Area. Steamboat is a major summer and winter recreational area. The diagram 5.5-2, page 5-90, shows a plume trajectory going directly over Steamboat Springs. Even though the plume will tend to disperse at this distance from the source, modeling should take place for this area and monitors should be placed in the vicinity of Steamboat Springs.

In conclusion the Colorado Mountain Club believes there are serious deficiencies in the air quality analyses in this DEIS. Much of this stems from lack of certainity regarding the retorting methods of the proposed development. We believe an air quality supplement is necessary before any permits are issued. We also believe that the FEIS should clarify the air quality modeling techniques.

Sincerely,
Anne Vickery
Anne Vickery
Conservation Director

Mobil Alternative Energy Inc.

P.O. BOX 17772
DENVER, COLORADO 80217

May 3, 1984

Mr. Phillip Neal
U. S. Department of Interior
Bureau of Land Management
764 Horizon Drive
Grand Junction, Colorado 81501

MOBIL COMMENTS ON
MOBIL-PACIFIC DEIS

Dear Mr. Neal:

Attached are Mobil's comments on the Mobil-Pacific DEIS.

Please notice our comments on pages 1-5 and 1-7. We have not previously called your attention to the fact that our preferred power line corridor crosses BLM land in T6S, R96W Sections 24 and 25. Mobil intends to request this right-of-way from BLM and we would like the EIS to be sufficient to support such a request.

Section 3.3.1.14 discusses socioeconomic impacts associated with the Parachute Project. While there are discussions of economic growth, there is no discussion of the benefits of such growth for many of the affected communities. An attempt to balance the adverse impacts and benefits as in the Clear Creek Shale Oil Project EIS would lead to a better decision document.

If we can provide further clarification, please do not hesitate to call.

Very truly yours,

C. G. Mattsson
Supervisor Technical Services

CGM/sw

cc: G. L. Higgins, Jr. - MAEI
R. D. Tull - MAEI

Mobil Comments on the Draft Mobil-Pacific Oil Shale Environmental Impact Statement

75 Page 1-2 Figure 1.0-1 shows County Roads 215 and 243 reversed.

Page 1-5 As shown by Figures 3.1-3 and 3.1-16, the preferred route for the power transmission line crosses BLM lands in T6S, R96W, Sections 24 and 25. Other than in the preferred design, Mobil has not yet indicated an intent to request right-of-way in these sections. We assume that treatment of the land as publicly owned (erroneously assumed to be NOSR) has provided sufficient analysis to allow such a right-of-way. Table 1.2-1 should be modified to include these lands. Based on the rationale utilized in Table 1.2-2, estimated disturbance on the approximately 1.5 mile corridor is about 6 acres. The total right-of-way corridor will be about 18 acres.

Page 1-7 Table 1.2-2 should be modified to reflect the presence of BLM land. Sections 25 and 24 should be removed from "Location of disturbance" for the power line. "Disturbance on NOSR-3" for the power line should be reduced to 13 acres.

Page 3-1 In the fourth line of the third paragraph, a dam and evaporation pond will be placed downstream of the fill...not "below" it.

Page 3-3 Figure 3.1-1 does not show BLM land in T6S, R96W Sections 25 and 24.

76

Page 3-8 Within the context of the section, the numbers on inlets and exhausts on Figure 3.1-3 have no meaning and could be confusing. They should be removed.

Page 3-11 In the second line of the third paragraph, the last word should be contaminant not "containment"

Page 3-23 The volume should be 180 gpm for "Filter backwash".

Page 3-25 In the last sentence of the first paragraph, "...the reservoir's normal high water surface elevation would be 5,929 feet." In the fourth paragraph, Dakota limestone should be Dakota sandstone.

Page 3-26 On Figure 3.1-9, "...on September 1st" is meaningless.

Page 3-31 Figure 3.1-11 does not show BLM land in T6S, R96W Sections 24 and 25.

Page 3-41 In Section 3.1.2.4, it should be understood that off-site upgrading is considered unreasonable based on lack of transportation for large volumes of raw shale oil. We refer you to our data submittal, Volume 2, Section 2.2.4, page 7, in which it is stated, "If cost competitive transport of raw shale oil becomes available, this alternative (remote upgrading) will be reconsidered." Also, as indicated on DEIS page 3-50 and Table 3.1-7, shipment of lesser quantities of raw shale oil by unit train is a reasonable alternative; therefore, use of unit trains during early stages of development will make off-site upgrading at existing refineries a possibility.

Page 3-44 Figure 3.1-14 does not show BLM land in T6S, R96W Sections 24 and 25.

Page 3-46 "Water diversion location" describes two alternative locations, whereas there are three (see Figure 3.1-12).

Page 3-50 In Section 3.1.2.8, it should be understood that while an average 30 inches of cover material suitable for vegetation is a preferred "target", sufficient information has not been collected to assure this amount of material is practically available at the Parachute Block. If sufficient material is not available, further consideration of the other alternatives may become necessary. In any event, a reclamation plan acceptable to the Colorado Mined Land Reclamation Division will be developed.

76

Page 3-64 In Table 3.2-3, the period of record for Main Elk is December 1964 to present; for East Elk, October 1966 to present.

Page 3-65 Main Elk Creek data was taken above the confluence with Elk Creek; "near Newcastle" is misleading.

Page 3-81 The third paragraph on page 3-81 is misleading in that the Main Elk Reservoir site will require about 3 acres in the Main Elk Creek Valley in addition to the 920 acres that Mobil currently owns. Efforts are under way to acquire the property.

Also, in the third paragraph, acreage references are incorrect. They should be Parachute Block--10,600; Mahaffey Ranch--1,350, and Main Elk Reservoir--920.

Page 3-117 Please define what is meant by "significant" visual impact.

77 Page 3-118 Operational visual impacts should be less than construction visual impacts because of reduced activity. Please define why a transmission line would cause a significant impact in Hayes Gulch.

78 Page 3-143 In the first complete paragraph it is stated, "Mobil proposes to house almost 25 percent of the nonlocal Project employees (15 percent of the total constroction work force) in a single-statos camp". It should be understood that the need for and size of a single-status camp will be determined by Project community needs at the time construction begins. As indicated on pages 3-177 and 3-178, the single-status camp is one of the mitigation

78 measures Mobil will consider. The camp may be smaller or larger than the 575 shown on page 3-43. The assumption used by BLM was provided by Mobil as a reasonable estimate based on information available in early 1983. Socioeconomic impact mitigation is best addressed by local officials when conditions to be mitigated are better understood.

79 Page 3-145 Analyses performed for Mobil by Mountain West Reserach-North, Inc. show different total Garfield and Mesa County impact numbers. These are provided in the attached table.

80 Page 3-170 Section 3.3.5 does not contain the qualification presented in Section 4.3.5 (page 4-148) regarding BLM's authority for enforcing mitigation on private lands. We assume this qualification also extends to Mobil.

81 Page 5-25 Under Section 5.14.7, please explain why the Mobil housing demand is 10 percent of the No Action Alternative impact and 15 percent of the high development scenario impacts. The percentages seem reversed.

:CBH424

TOTAL GARFIELD AND MESA IMPACT NUMBERS

(Compare with DEIS page 3-141)

1980	0
1981	0
1982	0
1983	0
1984	0
1985	0
1986	0
1987	52
1988	93
1989	216
1990	218
1991	687
1992	1,167
1993	1,890
1994	2,309
1995	2,938
1996	3,058
1997	3,437
1998	3,728
1999	4,936
2000	4,726
2001	4,681
2002	4,520
2003	4,628
2004	4,733
2005	4,835
2006	4.924
2007	5,011
2008	5,170
2009	5,352

Cleveland-Cliffs
Helping develop earth's resources to meet the world's needs.

Western Division

818 Taughenbaugh Boulevard
P.O. Box 1211, Rifle, CO 81650
Phone: 303 625-2445

May 4, 1984

Mr. Phillip Neal
Team Leader
Mobil-Pacific EIS
BUREAU OF LAND MANAGEMENT
Grand Junction District Office
764 Horizon Drive
Grand Junction, Colorado 81501

Dear Mr. Neal:

The purpose of this letter is to submit comments on the Draft Mobil-Pacific Oil Shale Environmental Impact Statement

The Draft Mobil-Pacific EIS is a high quality comprehensive and objective analysis of the project specific and cumulative environmental impacts of the Parachute Shale Oil Project and the Pacific Shale Project. Attached are a few specific comments on the Draft Mobil-Pacific EIS. These comments are submitted in order to contribute to the data base of relevant information and to contribute to the discussion and analysis of environmental impacts.

The Pacific Shale Project appreciates the opportunity to provide comments on the Draft Mobil-Pacific EIS. If you should have any questions in regard to this letter or the attached comments, please contact me personally at your earliest convenience.

Sincerely,

Truman E. Louderback
Truman E. Louderback
Project Engineer, Environmental
on behalf of the
Pacific Shale Project

TEL/vc

COMMENTS ON
DRAFT MOBIL-PACIFIC OIL SHALE ENVIRONMENTAL IMPACT STATEMENT

Submitted by
Truman E. Louderback
on behalf of
Pacific Shale Project

	Page(s)	Paragraph(s)	Comments
82	4-33		In Table 4.1-7, the in situ alternative retort technology should be changed to an unreasonable alternative and should be eliminated from detailed analysis. The reason for elimination from detailed analysis is that the technology is not adequately developed. Also, this change will make the in situ retort technology alternative consistent with the in situ mining method alternative.
83	4-53	2 and 3	The report by Weeks et al (1974) describes the hydrology of the Piceance Basin drained by Piceance Creek and Yellow Creek (White River drainage). The report does not accurately describe the hydrology of the Pacific Shale Project area which is drained by Roan Creek and Clear Creek (Colorado River Drainage). As reported on pages 3-29 and 3-30, Groundwater Interim Baseline Report, Pacific Shale Project, data from two core holes drilled on Pacific property within the stratigraphic sequence comprising the plateau below the Mahogany Zone (mine zone) indicate that no significant water bearing intervals exist below the proposed mining zone. A few fractured zones carrying little or no water were encountered, but these are situated below at least 100 feet of competent rock. This hydraulic isolation indicates that neither significant recharge to, nor discharge from, these lower strata occurs in the project area. Outcrops of bedrock strata below the Mahogany Zone were inspected in the field in the project area, and no discharge by springs or seeps was evident. Outcrop zones occur on the northwest, west, south and southeast portions of the project area, encompassing nearly 80 percent of the perimeter. There is no valid evidence applicable to the Pacific Shale Project area to document recharge to or discharge from the Garden Gulch and Lower Parachute Creek members of the Green River Formation.

	Page(s)	Paragraph(s)	Comments
84	4-82	4	The low grade deposits of sand and gravel in Deer Park Gulch, Scott Gulch, corridor areas, and the location of the water intake facility are thought to be nonexistent.
85	4-83	3	The Pacific Shale Project would produce 107,000 BPSD of hydrotreated shale oil and generate approximately 90 percent of the electricity required. Please explain the phrase, "... some additional oil and gas would also be required to balance the electricity needs of the project".
86	4-85	3	There are numerous examples of successful reclamation and resturation of wildlife habitat on 2:1 embankment slopes and on soils similar to those in the Pacific Shale Project area. Specific examples are evident at the Cameo coal mine and power plant near the Pacific Shale Project area, and at coal mines near Craig, Colorado. It is believed that the erosion impacts on the embankment face of the retorted shale disposal pile are exaggerated. Reclamation of the embankment face will be conducted in compliance with the Colorado Mined Land Reclamation Act and the Colorado Mined Land Reclamatiun Board Rules and Regulations.
87	4-87	4 and 5	As stated, surface water runoff and groundwater discharge from the Uinta aquifer and the Upper Parachute Creek aquifer (leach zone) would be diverted around the retorted shale disposal pile. This diversion would eliminate recharge to the alluvial aquifer in the area of the disposal pile. Below the leach zone lies 200 or more feet of marlstone which has little or no fracturing. The Mahogany Oil Shale Zone is nut regarded, either on Pacific or regionally, as a significant water-bearing interval. Drill core data from seven holes on the Pacific property further indicate a lack of either primary or secondary permeability within the zone. No significant water-bearing intervals exist below the proposed mining zone. Neither significant recharge to nor discharge from strata below the mine zone (Mahogany Zone) occurs on the Pacific Shale Project area. Eight of the ten springs on the Pacific Shale Project area emanate from the mesa top at or above the contact between the Uinta Formation and Green River Formation at elevations ranging from 7,740 to 8,120 feet. Two springs were observed

	Page(s)	Paragraph(s)	Comments
87	4-87	4 and 5 (continued)	discharging from alluvial deposits on the banks of Clear Creek and Conn Creek during spring sampling. Both alluvial springs were dry during summer and fall sampling periods and are, therefore, intermittent. Outcrops of bedrock strata below the Mahogany Zone were inspected in the field and no discharge by springs or seeps was evident. (Refer to Draft EIS reference, CDM, 1983g.) As previously discussed the information contained in Section 4.2.5 of the Draft EIS is not thought to be representative of the groundwater hydrology of Pacific Shale Project area. There is no evidence to indicate that Deer Park Gulch is an area of local groundwater discharge for the Lower Parachute Creek member. There is not sufficient evidence to indicate that significant evapotranspiration occurs from the Lower Parachute Creek member. Evapotranspiration is not quantified in order to determine if the impacts are significant. The surface of the Lower Parachute Creek member is not saturated, and there is no evidence of saturation beneath the surface. Since the surface and subsurface areas are not saturated there is no logical reason to speculate that the retorted shale disposal pile would become saturated. Groundwater, if present, would not flow through the 10-foot thick impervious liner of the retorted shale disposal pile, but would flow the direction gravity and least resistance (to areas down valley of the retorted shale disposal pile). The impacts to groundwater and surface water are greatly exaggerated. Based on valid existing site-specific information, the impacts should not be significant.
88	4-91	3	Describe surface water quality impacts that could occur by the mechanism described in Section 4.3.1.5. Does evapotranspiration discharge become surface discharge? How does this occur after retorted shale disposal if there is no evidence of it occurring at this time?
89	4-94		It shuuld be reiterated that there are three alternatives for water storage for the Pacific Shale Project. Only the use of the G-C-C reservoir alternative would require maximum withdrawal rates of approximately 48 cfs. The maximum withdrawal rate for the other two alternatives and the average water withdrawal for all three alternatives would be approximately 32 cfs.

	Page(s)	Paragraph(s)	Comments
90	4-99	3	Please reference the source of the information for sun-loving meadowrue. The Vegetation Baseline Report, Pacific Shale Project (CDM, 1983h) states that sun-loving meadowrue is known to have five population centers. Wilken stated he had about 15 collection records from the Cathedral Bluffs and Anvil Points areas. The statement that "The retorted shale disposal site would cover approximately 90 percent of the total known population of sun-loving meadowrue" is believed to be inaccurate and misleading.
91	4-99	7	According to the CDM report (Appendix H, CDM, 1983d), Scott Gulch is not within an area of critical winter range for mule deer. Please provide references for the estimates of deer and elk critical habitat. Is this loss of habitat significant regionally (Piceance Basin)?
92	4-103		In Table 4.3-10, it is believed that the last column should be labeled "7:00 p.m. to next 7:00 a.m. dBA".
93	4-105	2	Erroneous data were used to model operational noise impacts. A railroad is not proposed by the Pacific Shale Project in the vicinity of the upgrade facility. Also, 400 cars would not be entering or leaving the plant vicinity. The cars would use the parking area located approximately three miles south of the main plant facility. It is stated that noise levels would exceed 100dBA; however, the maximum noise levels shown in Figure 4.3-4 are 90dBA on-site.
94	4-144		Section 4.3.2, third bullet states: "Given current mining technology 38 percent of the oil shale resource un the Pacific property could remain unrecoverable." This statement is true for both the "no-action alternative" (existing condition) and the "proposed action". This bullet should be removed from the list of adverse environmental impacts.
95	4-167	5	Twenty-ton truck traffic would occur on the road between DeBeque and the project site for both transportation alternatives. However, there would be fewer trucks on the road if a railroad was constructed and operated. Even with the railroad, local goods from Grand Junction, Rifle, Glenwood Springs, etc., and a nominal amount of regional

	Page(s)	Paragraph(s)	Comments
95	4-167	5 (continued)	materials from Denver, Salt Lake City, etc., would be delivered by truck. Therefore, road rights-of-way and road upgrading would be necessary and similar for both transportation alternatives. If constructed, the railroad would require rights-of-way and would create surface disturbances.
96	5-12 5-13	7 1 and 2	It should be considered that the proposed reservoirs (G-C-C and Main Elk Creek) could significantly decrease the silt load and turbidity in the Colorado River. This would be a significant positive impact, considering that, "Overall sediment loadings for Roan Creek are 0.5 to 1.0 acre foot per square mile of drainage area, while total sediment delivery from the Roan Creek Basin is about 600,000 tons per year." (Refer to paragraph 3, page 4-59, Draft EIS.)
97	5-22	3	Please compare this paragraph with Table 4.3-13. Pacific's maximum projected employment of 3,435 people would occur in 1999.

United States Department of the Interior
BUREAU OF RECLAMATION
UPPER COLORADO REGIONAL OFFICE
P.O. BOX 11568
SALT LAKE CITY, UTAH 84147

In Reply Refer To: UC-150
120.1

MAY 3 1984

Memorandum

To: Mr. Philip L. Neal, EIS Team Leader, Bureau of Land Management, 764 Horizon Drive, Grand Junction, Colorado 81501

From: Acting Regional Director

Subject: Review Comments - Draft Mobil-Pacific Oil Shale Environmental Impact Statement, March 1984, Bureau of Land Management (DES 84-10)

General

It is interesting to note that of the 18 categories of issues or topics of concern raised by the public during scoping sessions, water resources are ranked as No. 2; yet, it is in the evaluation of water resource alternatives and impacts that the subject statement falls short in presenting a comprehensive and complete analysis.

In the case of Mobil's water supply requirements for a 100,000 barrel per day (BPD) facility, a total of 22.6 ft^3/s, or about 16,000 acre-feet per year is needed. Over half of this raw water requirement would be for evaporative cooling, processed shale quenching, and processed shale moisturizing. According to the text, the bulk of this requirement could be met by using water of degraded quality.

98 Similarly, the Pacific Project water supply requirement for a 100,000 BPD facility is 21,000 acre-feet per year with over 70 percent targeted for cooling, mining, and retorted shale disposal.

For both the Mobil and Pacific Projects, the only water supply alternatives considered in the statement involved existing or proposed reservoirs drawing upon Colorado River water. Although reuse and recycling concepts were hinted at in the plants' water balances, neither facility considered a water supply using water of degraded quality.

Since 1973 the Bureau of Reclamation has been studying alternative ways to reduce or eliminate the salt contributions to the Colorado River from two mineral springs' areas upstream from the proposed oil shale facilities. Based on feasibility studies and public input, the recommended plan for the Glenwood-Dotsero Springs Unit consists of collecting about 21.4 ft^3/s of 14,000 mg/L TDS water and pipelining the water 130 miles downriver to Mack, Colorado, for

---

disposal (see attachment). In effect, the proposed saline water pipeline would go right past the "front door" of both Mobil and Pacific Projects. Moreover, based on current investigations of available technology, we believe that the saline water still has utility for beneficial use in oil shale processing. We would be remiss not to point out the availability of saline water in meeting at least a portion of the water requirement for oil shale. There are some impressive environmental and economic incentives in this situation for substituting saline water for fresh water use in oil shale development; for example, instead of increasing the salinity at Imperial Dam by about 2 mg/L due to freshwater depletions for both projects, a net decrease of salinity of about 31 mg/L would result with use and zero discharge disposal of Glenwood Springs' flows. 98 Aside from the existing Reclamation plan to pipeline pressurized saline water past the "front door" of these projects, there are economic incentives for the Federal Government to cost-share in the use and final disposal of the saline water. Although the use of saline water would not offset the total water requirement or meet specific water quality process needs, a partial alternative saline water source would effectively serve to decrease storage requirements and environmental impacts for the proposed freshwater sources. In addition, the assurance that both Mobil and Pacific Projects will meet zero discharge requirements would satisfy concerns over final disposal or containment of waste products as well as salt.

In terms of the cumulative impacts of the five proposed oil shale projects and related powerplant, the freshwater withdrawal of 146.8 ft^3/s or 106,000 acre-feet per year is significant. The cumulative water quality impact of 5.5 mg/L TDS at Imperial Dam due to the depletions is only one indicator of the long-term consequences of limited water supply in the Colorado River Basin. Every effort should be made to utilize existing water resources in the most effective manner while minimizing unavoidable environmental impacts.

The Bureau of Reclamation is prepared to work with the Bureau of Land Management and cooperating industrial participants in exploring saline water use opportunities for the Mobil and Pacific Projects, as well as other oil shale facilities proposed in the Colorado River Basin.

Specific

99 1. Page 2-18, Surface Water Quality - The average annual TDS values of 697 and 879 mg/L stated for Hoover Dam and Imperial Dam, respectively, are in error. Published data from Quality of Water, Colorado River Basin, Progress Report No. 11 (USDI, 1983), lists the values of 691 and 816 mg/L TDS for Hoover and Imperial Dam as the latest available data.

100 2. Page 3-39 - The Glenwood-Dotsero Springs' water should be added to the listing of water supply alternatives. It is considered a reliable supply with the collection system and pipeline works under feasibility study.

101 3. Page 4-22 - The discussion of water supply alternatives for the Pacific Project should be expanded to include Glenwood-Dotsero Springs.

102 4. Page 4-91 - Please clarify the design of the disposal area containment system. What type of bottom liner will be used? How will leakage be monitored?

103 [5. Page 5-12 - While we agree that erosion and leaching of TDS, organics, and metals from retorted shale disposal areas are difficult to quantify, it is imperative that design safeguards be provided to monitor and/or capture any leakage of contaminants.

Attachment

cc: Commissioner, Attention: 115, 150, & 700
Projects Manager, Grand Junction, Colorado, Attention: 700 (Mezai)
Project Manager, Saline Water Transport and Use Office, E&R Center
Chief, Division of Planning Technical Services, E&R Center
(each w/copy of attachment)

SUMMARY SHEET
Glenwood-Dotsero Springs Unit
Colorado River Water Quality Improvement Program

April 1982
Page 1 of 2

LOCATION

The Glenwood-Dotsero Springs Unit of the Colorado River Water Quality Improvement Program extends across three counties in western Colorado. The Glenwood springs are located adjacent to the Colorado River in Garfield County while the Dotsero springs are located adjacent to the Colorado River in Eagle County near the Eagle County-Garfield County line. The pipeline in the recommended plan would begin at the Dotsero springs and, paralleling the Colorado River, would traverse the remainder of western Colorado, terminating at the proposed evaporation ponds near the Colorado-Utah border in Mesa County.

PURPOSE

The purpose of the study is to determine a feasible alternative to reduce or eliminate the salt contribution to the Colorado River from an area of intense mineral spring flows. Glenwood-Dotsero springs constitute the second largest point source of salinity to the Colorado River. The combined discharges annually contribute approximately 25,000 acre-feet of water containing about 500,000 tons of salt. About half the salt contribution comes from 20 identified springs. Capture of subsurface brine could provide additional salinity reduction. From the alternatives studied, a recommended plan was chosen and will be presented in a feasibility report.

STATUS

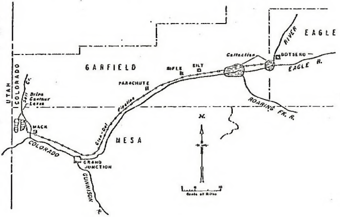
Feasibility studies of the Glenwood-Dotsero Springs Unit are being conducted under the Federal Water Pollution Control Act of October 18, 1972 (Public Law 92-500), the Colorado River Basin Salinity Control Act of June 24, 1974 (Public Law 93-320), and Public Law 96-375 of October 3, 1980.

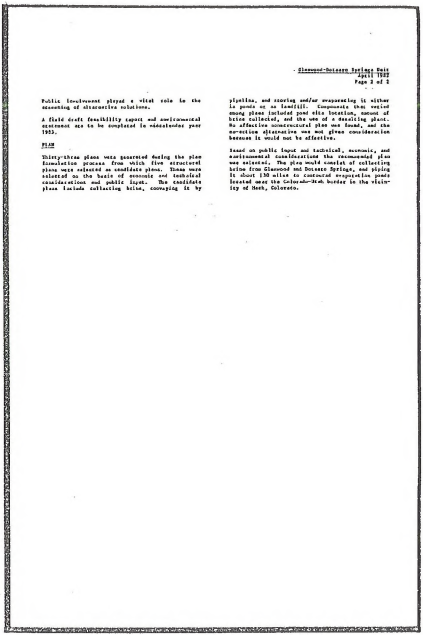
The feasibility investigations of these springs have included the collection and chemical analysis of spring flow samples and the measurement of the flows of 20 known springs that are considered amenable to collection for desalination. Topographical maps of the Dotsero area were made during March and April 1973, and an electrical resistivity survey, conducted by Applied Geophysics of Salt Lake City, Utah, was completed on May 1, 1973. This survey was to help identify aquifers and geological conditions governing the subsurface flow of the saline water. A weather station to gather evaporation data was installed in 1977.

A notice of initiation of investigations was issued in January 1980. The Bureau of Reclamation is being aided in the study by a multidisciplinary planning team, a professional services contractor, and the general public.

A contract for the technical work during Phase I of the investigations was awarded to URS Corporation of Denver. Phase I work concluded with selection of the recommended plan in January 1982. Phase II technical work will be contracted out, and will include completion of the feasibility level designs and estimates, and data collection for the environmental statement.

Reclamation is conducting those portions of the study concerning public involvement and technical review.





Glenwood-Dotsero Springs Unit
April 1982
Page 2 of 2

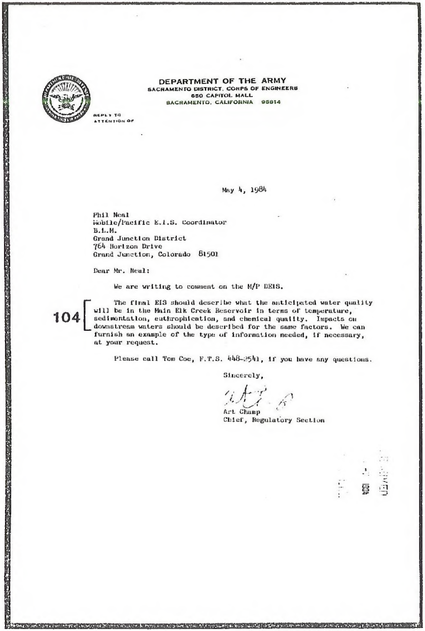
Public involvement played a vital role in the screening of alternative solutions.

A field draft feasibility report and environmental statement are to be completed in midcalendar year 1983.

PLAN

Thirty-three plans were generated during the plan formulation process from which five structural plans were selected as candidate plans. These were selected on the basis of economic and technical considerations and public input. The candidate plans include collecting brine, conveying it by pipeline, and storing and/or evaporating it either in ponds or as landfill. Components that varied among plans included pond site location, amount of brine collected, and the use of a desalting plant. No effective nonstructural plan was found, and the no-action alternative was not given consideration because it would not be effective.

Based on public input and technical, economic, and environmental considerations the recommended plan was selected. The plan would consist of collecting brine from Glenwood and Dotsero Springs, and piping it about 130 miles to contoured evaporation ponds located near the Colorado-Utah border in the vicinity of Mack, Colorado.



DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

REPLY TO
ATTENTION OF

May 4, 1984

Phil Neal
Mobile/Pacific E.I.S. Coordinator
B.L.M.
Grand Junction District
764 Horizon Drive
Grand Junction, Colorado 81501

Dear Mr. Neal:

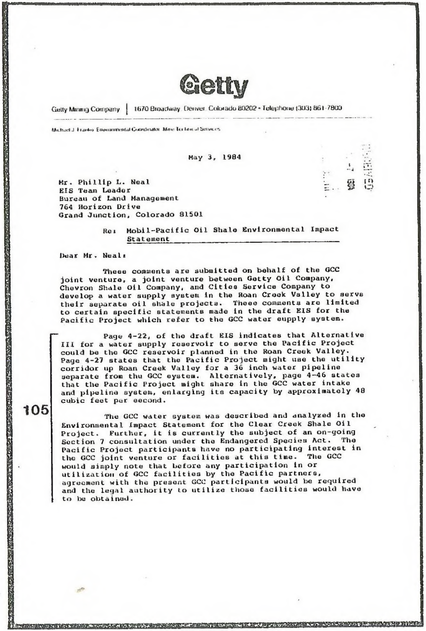
We are writing to comment on the M/P DEIS.

104 The final EIS should describe what the anticipated water quality will be in the Main Elk Creek Reservoir in terms of temperature, sedimentation, euthrophication, and chemical quality. Impacts on downstream waters should be described for the same factors. We can furnish an example of the type of information needed, if necessary, at your request.

Please call Tom Coe, F.T.S. 448-2541, if you have any questions.

Sincerely,

Art Champ
Chief, Regulatory Section



Getty

Getty Mining Company | 1670 Broadway, Denver, Colorado 80202 • Telephone (303) 861-7800

Michael J. Franko, Environmental Coordinator, Mine Technical Services

May 3, 1984

RECEIVED
7 1984

Mr. Phillip L. Neal
EIS Team Leader
Bureau of Land Management
764 Horizon Drive
Grand Junction, Colorado 81501

Re: Mobil-Pacific Oil Shale Environmental Impact Statement

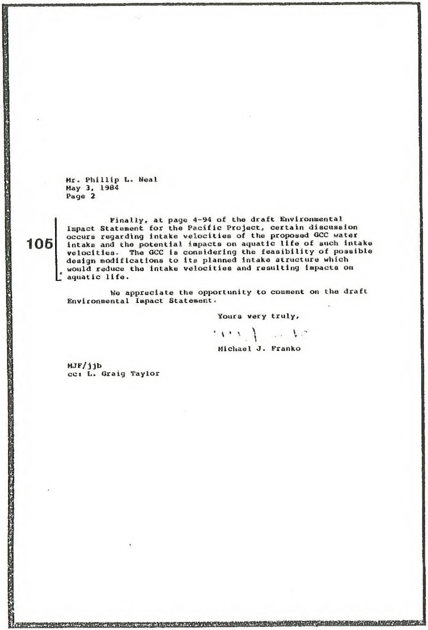
Dear Mr. Neal:

These comments are submitted on behalf of the GCC joint venture, a joint venture between Getty Oil Company, Chevron Shale Oil Company, and Cities Service Company to develop a water supply system in the Roan Creek Valley to serve their separate oil shale projects. These comments are limited to certain specific statements made in the draft EIS for the Pacific Project which refer to the GCC water supply system.

Page 4-22, of the draft EIS indicates that Alternative III for a water supply reservoir to serve the Pacific Project could be the GCC reservoir planned in the Roan Creek Valley. Page 4-27 states that the Pacific Project might use the utility corridor up Roan Creek Valley for a 36 inch water pipeline separate from thu GCC system. Alternatively, page 4-46 states that the Pacific Project might share in the GCC water intake and pipeline system, enlarging its capacity by approximately 48 cubic feet per second.

105

The GCC water system was described and analyzed in the Environmental Impact Statement for the Clear Creek Shale Oil Project. Further, it is currently the subject of an on-going Section 7 consultation under the Endangered Species Act. The Pacific Project participants have no participating interest in the GCC joint venture or facilities at this time. The GCC would simply note that before any participation in or utilization of GCC facilities by the Pacific partners, agreement with the present GCC participants would be required and the legal authority to utilize those facilities would have to be obtained.



Mr. Phillip L. Neal
May 3, 1984
Page 2

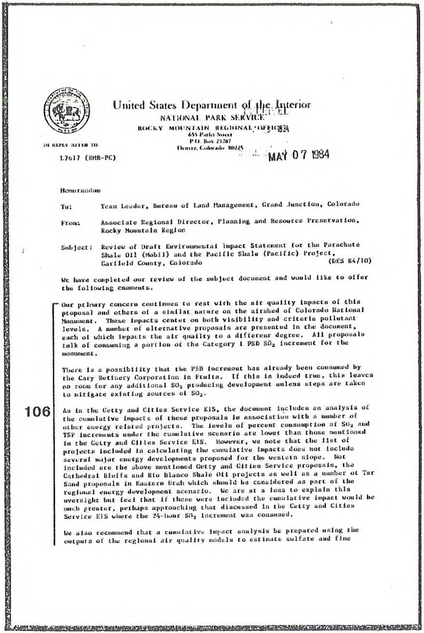
105 Finally, at page 4-94 of the draft Environmental Impact Statement for the Pacific Project, certain discussion occurs regarding intake velocities of the proposed GCC water intake and the potential impacts on aquatic life of such intake velocities. The GCC is considering the feasibility of possible design modifications to its planned intake structure which would reduce the intake velocities and resulting impacts on aquatic life.

We appreciate the opportunity to comment on the draft Environmental Impact Statement.

Yours very truly,

Michael J. Franko

MJF/jjb
cc: L. Graig Taylor



United States Department of the Interior
NATIONAL PARK SERVICE
ROCKY MOUNTAIN REGIONAL OFFICE
655 Parfet Street
P.O. Box 25287
Denver, Colorado 80225

IN REPLY REFER TO:

L7617 (RMR-PC)

MAY 07 1984

Memorandum

To: Team Leader, Bureau of Land Management, Grand Junction, Colorado

From: Associate Regional Director, Planning and Resource Preservation, Rocky Mountain Region

Subject: Review of Draft Environmental Impact Statement for the Parachute Shale Oil (Mobil) and the Pacific Shale (Pacific) Project, Garfield County, Colorado (DES 84/10)

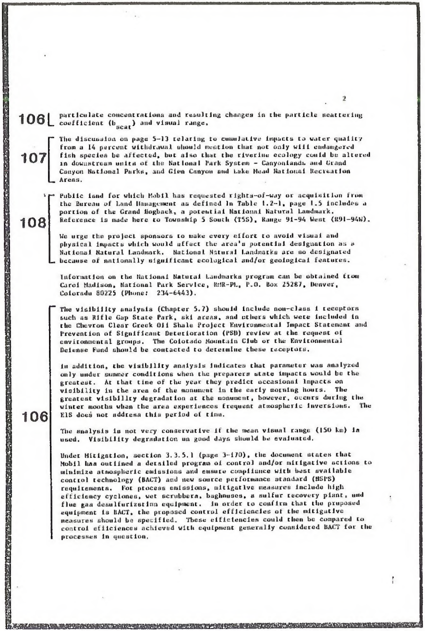
We have completed our review of the subject document and would like to offer the following comments.

Our primary concern continues to rest with the air quality impacts of this proposal and others of a similar nature on the airshed of Colorado National Monument. These impacts center on both visibility and criteria pollutant levels. A number of alternative proposals are presented in the document, each of which impacts the air quality to a differenr degree. All proposals talk of consuming a portion of the Category 1 PSD SO_2 increment for the monument.

There is a possibility that the PSD increment has already been consumed by the Cary Retinery Corporation in Fruita. If this is indeed true, this leaves no room for any additional SO_2 producing development unless steps are taken to mitigate existing sources of SO_2.

106 As in the Getty and Cities Service EIS, the document includes an analysis of the cumulative impacts of these proposals in association with a number of other energy related projects. The levels of percent consumption of SO_2 and TSP increments under the cumulative scenario are lower than those mentioned in the Getty and Cities Service EIS. However, we note that the list of projects included in calculating the cumulative impacts does not include several major energy developments proposed for the western slope. Not included are the above mentioned Getty and Cities Service proposals, the Cathedral Bluffs and Rio Blanco Shale Oil projects as well as a number of Tar Sand proposals in Eastern Utah which should be considered as part of the regional energy development scenario. We are at a loss to explain this oversight but feel that if these were included the cumulative impact would be much greater, perhaps approaching that discussed in the Getty and Cities Service EIS where the 24-hour SO_2 increment was consumed.

We also recommend that a cumulative impact analysis be prepared using the outputs of the regional air quality models to estimate sulfate and fine



106 particulate concentrations and resulting changes in the particle scattering coefficient (b_{scat}) and visual range.

107 The discussion on page 5-13 relating to cumulative impacts to water quality from a 14 percent withdrawal should mention that not only will endangered fish species be affected, but also that the riverine ecology could be altered in downstream units of the National Park System - Canyonlands and Grand Canyon National Parks, and Glen Canyon and Lake Mead National Recreation Areas.

108 Public land for which Mobil has requested rights-of-way or acquisition from the Bureau of Land Management as defined in Table 1.2-1, page 1.5 includes a portion of the Grand Hogback, a potential National Natural Landmark. Reference is made here to Township 5 South (T5S), Range 91-94 West (R91-94W).

We urge the project sponsors to make every effort to avoid visual and physical impacts which would affect the area's potential designation as a National Natural Landmark. National Natural Landmarks are so designated because of nationally significant ecological and/or geological features.

Information on the National Natural Landmarks program can be obtained from Carol Madison, National Park Service, RMR-PL, P.O. Box 25287, Denver, Colorado 80225 (Phone: 234-6443).

The visibility analysis (Chapter 5.7) should include non-class 1 receptors such as Rifle Gap State Park, ski areas, and others which were included in the Chevron Clear Creek Oil Shale Project Environmental Impact Statement and Prevention of Significant Deterioration (PSD) review at the request of environmental groups. The Colorado Mountain Club or the Environmental Defense Fund should be contacted to determine these receptors.

In addition, the visibility analysis indicates that parameter was analyzed only under summer conditions when the preparers state impacts would be the greatest. At that time of the year they predict occasional impacts on visibility in the area of the monument in the early morning hours. The greatest visibility degradation at the monument, however, occurs during the winter months when the area experiences frequent atmospheric inversions. The EIS does not address this period of time. 106

The analysis is not very conservative if the mean visual range (150 km) is used. Visibility degradation on good days should be evaluated.

Under Mitigation, section 3.3.5.1 (page 3-170), the document states that Mobil has outlined a detailed program of control and/or mitigative actions to minimize atmospheric emissions and ensure compliance with best available control technology (BACT) and new source performance standard (NSPS) requirements. For process emissions, mitigative measures include high efficiency cyclones, wet scrubbers, baghouses, a sulfur recovery plant, and flue gas desulfurization equipment. In order to confirm that the proposed equipment is BACT, the proposed control efficiencies of the mitigative measures should be specified. These efficiencies could then be compared to control efficiences achieved with equipment generally considered BACT for the processes in question.

106 In the technical report, pages 5-3 to 5-5, both Mobil and Pacific projects are 100,000 barrels per day plants, both involve underground mining and onsite surface retorting. Why then are Mobil's sulfur dioxide (SO_2) emissions more than twice those of Pacific's?

There should be an explanation of why the Mobil measured annual SO_2 background concentration (11 or 12 ug/m^3) is so much larger than the assumed background (1 ug/m^3) for Pacific (pages 5-13 to 5-18).

The box modeling for the Pacific project site should undergo performance evaluations according to the Environmental Protection Agency's Modeling Guideline (page 5-26 to 5-32).

109 A final minor comment, on page 2-26 the statement is made that a portion of Colorado National Monument is located in Mesa County. The entire monument is located in Mesa County.

Richard A. Strait

United States Department of the Interior
NATIONAL PARK SERVICE
AIR QUALITY DIVISION
P. O. BOX 25287
DENVER, CO 80225

IN REPLY REFER TO:

August 7, 1984

N3615 (475)

Memorandum

AUG 0 9 RECD

To: Air Quality Specialist, Colorado State Office, Bureau of Land Management

From: Chief, Policy, Planning and Implementation Branch, Air and Water Quality Division, National Park Service (NPS)

Subject: July 18, 1984 BLM/NPS Meeting and Clarification of NPS Comments on the Draft Mobil-Pacific Oil Shale EIS

On July 18, 1984, NPS and BLM staff met to discuss and clarify the NPS comments on the Mobil-Pacific Oil Shale draft EIS. The NPS comments (attached) were transmitted to BLM in a May 7, 1984, memorandum from the Associate Regional Director, Planning and Resource Preservation to the BLM EIS Team Leader. At the July 18 meeting, I promised to put in writing the clarifications we discussed at that time.

The following are our clarifications to the air quality/visibility comments raised in the May 7, 1984 memo and correspond to the paragraphs in the May 7 memo.

May 7 Paragraph No.	Clarification
2, 3	In referring to the possible total SO_2 increment consumption by Gary Refinery Corporation at Colorado National Monument, the NPS referred to the Colorado State category 1 SO_2 increment, not the Federal PSD class I increment. This issue surfaced after the DEIS air quality analysis was performed and we do not expect BLM to be able to resolve this issue in the final EIS. This issue will be resolved during new source and PSD permit review for the Mobil-Pacific projects by the State of Colorado and/or EPA Region VIII. Our comment was for information purposes.

4 Table 5.1-3 on page 5-8 of the Mobil-Pacific Air Quality Technical Report lists the oil shale and tar sands project emissions that were modelled in the cumulative analysis. We understand that the emissions from the Getty and Cities Service projects were not included because of the relative timing of the Mobil-Pacific and Getty-Cities Service EIS. The air quality technical report for Mobil-Pacific was completed before the Getty-Cities Service air quality analysis.

The Getty-Cities Service final EIS will include that project's emissions as well as those from Mobil-Pacific and others in the cumulative analysis. When applying for a PSD and new source permit, Mobil-Pacific will need to perform a cumulative air quality analyses including any projects which have been permitted or have submitted complete permit applications.

5 We understand that the TAPAS model output does not easily lend itself to such a haze and visual range analysis. The current lack of visibility and fine particle data also make it difficult to perform such an analysis. Such an analysis may be performed during the PSD permit review.

10 The comment concerning a visibility analysis for non-class I area receptors was for information purposes only. As you are aware, the lack of such an analysis in the Chevron Clear Creek Oil Shale Project PSD application led to a lengthy delay in EPA Region VIII proposing a PSD permit for this project. This issue will surely surface during the PSD review for Mobil-Pacific.

11, 12 These comments were for information purposes only and we expect a more detailed, conservative visibility analysis to be performed during the PSD permit review.

13 We request that the proposed control efficiencies be specified. In developing the emission inventories for the air quality analysis, certain control efficiencies had to have been assumed. These efficiencies could then be compared to control efficiencies achieved with equipment generally considered as BACT for the processes in question.

14, 15 These comments require no clarification.

16 There is no requirement for model performance evaluations for air quality models used in EIS analyses. However, there is such a requirement for model comparisons and evaluations with EPA guideline models during the PSD permit review. The box modeling for the Pacific project site, if used in the PSD permit review, must undergo the model performance evaluation at that time.

I hope these clarifications are helpful to you in responding to our comments. Please contact me at 234-6419 if you have any other questions.

Christine L Shaver
Christine L. Shaver

Attachment

cc:
RMR-PRP: Strait
COLM: Huffman

T. PETER CRAVEN
Attorney at Law
POST OFFICE BOX 1105
GLENWOOD SPRINGS, COLORADO 81602

TELEPHONE 303-945-8571

May 8, 1984

Mobil - Pacific
EIS Team Leader
Bureau of Land Management
764 Horizon Drive
Grand Junction, CO 816501

Re: Mobil-Pacific Oil Shale Environmental
Impact Statement-Earl Dawson

Dear Sir:

110 The draft Mobil-Pacific Oil Shale Environmental Impact Statement implies in various places that the applicant is the owner of the land which will be submerged with water upon the creation of the Main Elk Reservoir Dam. Please be advised that Earl and Donna Dawson are the owners of the following described property located in the proposed reservoir storage area:

> A tract of land situate in the SW 1/4 NW 1/4 and in NW 1/4 SW 1/4 of Section 14, T. 5 S., R. 91 W., 6th P.M., more fully described as follows:
>
> Beginning at a point on the Easterly line of County Road whence the Southwest corner of said NW 1/4 SW 1/4 bears S. 16 degrees 06 minutes W. 1946.79 feet, thence South 53 degrees 09 minutes W. 252.0 feet along the Easterly line of County Road, thence S. 29 degrees 24 minutes W. 71.65 feet along Easterly line of County Road, thence S. 19 degrees 03 minutes W. 209.35 feet along Easterly line of County Road, thence S. 0 degrees 42 minutes W. 144.18 feet along Esterly line of County Road; thence S. 86 degrees 01 minutes E. 170.69 feet to center of Middle Elk Creek' thence N. 28 degrees 13 minutes E. 450.8 feet along center of Middle Elk Creek; and thence N. 28 degrees 42 minutes W. 200.0 feet to the point of beginning, containing 3 acres, more or less. County of Garfield, State of Colorado.

You are further advised that Earl and Donna Dawson oppose the project.

Very truly yours,

T. Peter Craven

TPC/da

STATE OF COLORADO RICHARD D. LAMM, Governor
DEPARTMENT OF NATURAL RESOURCES
DAVID H. GETCHES, Executive Director
1313 Sherman St., Room 718, Denver, Colorado 80203 866-3311

Geological Survey
Board of Land Commissioners
Mined Land Reclamation
Division of Mines
Oil and Gas Conservation Commission
Division of Parks & Outdoor Recreation
Soil Conservation Board
Water Conservation Board
Division of Water Resources
Division of Wildlife

May 8, 1984

Mr. Phillip Neal
U.S. Bureau of Land Management
764 Horizon Drive
Grand Junction, Colorado 81502

Dear Mr. Neal:

Colorado state agencies appreciate the opportunity to submit comments on the Draft Mobil-Pacific Oil Shale Environmental Impact Statement. A consolidated set of agency review comments is attached to this letter.

111 As was the case in previous oil shale project reviews, several agencies have identified areas in the document which require additional or more detailed information. Informational needs which pertain to significant environmental impacts should be met either by incorporating relevant data in the Final EIS or supplementing the NEPA process when more project-specific data are available.

One key need is for a fuller description of the impacts to air, water and biological resources of Mobil's retorting and spent shale disposal activities. In the absence of a proposed retort technology (or mix of technologies), it is not possible to determine the emissions, waste streams and waste products so important to the identification and measurement of these impacts. This additional detail will certainly become part of future permitting actions; however, it should also be part of the NEPA record.

Similarly, the Pacific Project will generate more information about its operations and impacts as project permits are prepared. Data necessary to the understanding of significant project impacts should be integrated into the appropriate NEPA document.

Our fundamental concern here is that various oil shale environmental impact statements are consistent in the level of detail required for adequate project-specific analyses. If initial NEPA actions are based on relatively general or indefinite proposals, then supplementary studies should be called for to yield the "full and fair discussion" of impacts mandated by the Council on Environmental Quality regulations. We believe this coverage of all oil shale project impacts to be crucial to good decision-making and equitable to proponents whose project planning reflects a wide range of definition and commitment.

Mr. Phillip Neal
May 8, 1984
Page Two

If you have any questions about the state's response or would like to discuss specific comments with the reviewing agencies, please contact Steve Norris at my office.

Sincerely,

DAVID N. GETCHES
Executive Director

DGN:ljc
Attachment

STATE OF COLORADO
COMMENTS ON THE
MOBIL-PACIFIC OIL SHALE
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Colorado State agencies have reviewed the Mobil-Pacific Oil Shale Draft Environmental Impact Statement. Outlined below are the major comments organized by discipline.

Air Quality

The EIS addresses the impacts from two - 100,000 barrel per day oil shale projects, and is similar to EIS's produced for other large oil shale projects. Impacts from each project alone show no NAAQS or Increment violations. Also, the cumulative analysis shows no NAAQS or Increment violations, although other EIS's have shown cumulative impacts which exceed these standards. Review of these EIS's brings one to the conclusion that the real impacts of oil shale facilities are not adequately understood and statements to this effect should be clearly stated in the EIS. Specifically, EIS's should state that there is the possibility that standards may be exceeded, which could result in the denial of permits for some of the projects (or at least later phases of the projects). Moreover, EIS's should acknowledge that various air quality models predict different levels of long-range impacts. Modeling efforts required for a PSD permit, for example, may be more conservative than modeling done solely for NEPA purposes.

112

The EIS should discuss; (a) the impacts that may result from the malfunctioning of control equipment; and (b) the emission rates of possible hazardous or toxic pollutants. (This was briefly discussed in the Air Quality Report, but not the EIS.)

A more thorough discussion of BACT to be applied to SO_2 and NO_x sources should be addressed, for example, post combustion/NO_x controls.

An explanation should be included in the Mobil section explaining why NO_x and SO_2 emissions are so high. Emissions of both of these pollutants are two times higher for Mobil than Pacific.

Once Mobil selects its retort technology, supplementary data should be made available through the EIS process. A description of likely air quality impacts must reflect specific controls applied to specific facilities. While this will certainly be done to obtain permits, it should also be done as part of the EIS analysis.

112

It is assumed that a cumulative impact analysis will include all existing and planned increment consuming sources. Only two sources, Mobil and Pacific, seem to have been included in the cumulative impact analysis for Colorado National Monument. This is unacceptable. The analysis of cumulative air quality impacts at Colorado National Monument shuuld be redone. The Air Pullution Control Division will provide guidelines for redoing this modeling analysis as soon as possible.

More detailed comments for both the EIS and Technical Report:

o EIS page 3-91, page 4-47; Technical Report page 5-63. What are the reasons for expecting summer tu be the season of maximum visibility impact?

o EIS Table 3.3-4, 4.3-5, and 5.14; Technical Report page 5-79, 80 Table 5.91-94. These tables give secondary pollutant impacts at Colorado River Valley locations. Do the impacts given in these tables include background concentrations? If not, statements that these areas are meeting NAAQS are not necessarily valid. If they do include background, the box model and assumed worst-case meteorological conditions do not correlate very well with observed TSP concentrations in 1980. The table below compares TSP concentrations calculated for the EIS and those monitored in 1980.

24-Hour TSP Concentrations (UG/M^3)

	EIS	OBSERVED 2ND MAX.
Rifle	49	479
Grand Junction	122	144
Parachute	92	254

On page 5-80 it is stated that the secondary modeling is only a toul for understanding how air quality might change in a relative sense, as a result of additional population. If this is the case, why then are the results of the secondary impact modeling compared to the NAAQS in the EIS on page 3-92, page 4-80, and page 5-6. No judgments as to whether the NAAQS will be met should have been made if this is giving just relative change.

o EIS page 4-73. It is stated that the maximum background TSP values occur during strong winds and neutral stability. Was this found to be the case with the TSP data taken at the Pacific monitoring sites?

112

o EIS page 4-75; Technical Report page 5-34. It is suggested that a realistic box height is somewhere above the plume height modeled in Case 5 and 6. As part of their air quality analysis, Union Oil Company conducted tracer tests in 1982 in Parachute Creek valley, a valley similar to where Pacific Oil Shale is proposing to locate. These tracer tests showed that a box model with a height equal tu the tracer release height (plume height) verified quite well with observed tracer gas concentrations. In addition, Union's tracer test showed that box models have a tendency to under-predict concentrations in boxes closest to the source.

Therefore, one would expect Cases 1 through 4 to be the most realistic and that concentrations in box 19 and 22 might be under-predicted.

What was the TSP concentration predicted in box 13?

o EIS page 5-2; Technical Repurt page 5-6, 5-8. Dorchester Coal, Gary Refining Company, Getty Oil Shale, and Cities Service Oil Shale should be included in the cumulative analysis. A portion of low level emissions, gases and small particulates, have the potential to be transported long distances.

o EIS page 5-2; Technical Report page 5-23. The Pacific Project's cumulative impact analysis shuuld include the results of box modeling. Emissions from the Chevron Retort and the Getty Oil Shale Project that are caught in the drainage flow into Clear Creek should be modeled along with emissions from Pacific Project. If cumulative box modeling was performed, we believe statements that cumulative impacts are essentially the same as impacts from the Pacific Project alone (EIS page 5-5; Technical Report page 5-23) would be proven incorrect. The SO_2 and TSP Class 2 increment exceedances found when the Pacific Project was modeled alone with a box model would be larger.

o EIS page 5-2; Technical Report page 5-55. The day selected for modeling, using TAPAS, was chosen because it was the day Complex I predicted the highest cuncentration at Flat Tops Wilderness Area. The TAPAS model and the Complex I model will not necessarily have the same worst-case day during agiven period. This is because the two models transport plumes differently. Complex I assumes straight-line plume transport from source to receptor, while TAPAS allows the plume to change directions with its varying windfield. Modeling Complex I's highest five-to ten days with TAPAS, would greatly increase the chances that TAPAS had been run under its worst-case day.

Water Quality

113 The EIS does include a presentation of the potential acid deposition of elemental sulfur from cumulative SO_2 emissions at Class I/Category I areas. However, the EIS should also analyze the potential pH changes in sensitive lakes in the Flat Tops Wilderness area due to acid deposition.

Water Conservation

114 The Colorado Water Conservation Board is actively involved in controlling the salinity in the Colorado River and encourages the beneficial use of saline water whenever possible. Saline water could be used for shale compaction and/or other project purposes and should be investigated. The Bureau of Reclamation's Glenwood-Dotsero Springs Salinity Control Unit could be a possible source for the saline water.

115 The report should have a short discussion on the depletion effects on the Colorado River in terms of compacts and downstream water users.

The flows listed in Table 5.7-1 are from a draft technical paper issued by the U.S. Fish and Wildlife Service (FWS) in the summer of 1983. These flows are not recommendations by the FWS, but merely are a presentation of some facts and figures which are both unclear and incomplete. The upper basin states and the FWS are working together to resolve this very complex and important issue. The narrative on page 5-13 should be revised to reflect the fact that the FWS is working on a conservation plan which may have streamflow requirements that could affect future water depletions.

116 The average annual salinity at Imperial Dam, as presented on page 2-18 is 879 mg/l. This seems high. Is this a flow-weighted average concentration? The long term average flow-weighted concentration listed in "Quality of Water -- Colorado River Basin, Progress Report No. 10", January, 1981, U.S. Department of the Interior -- Bureau of Reclamation, is substantially less than 879 mg/l.

Water Resources

There might be some confusion concerning the discussion of the Piceance Basin, especially Figures 2.5-1 and 2.5-2. The FEIS should more clearly explain that the project areas are a part of the Piceance geologic basin not the Piceance Creek drainage.

The FEIS would be improved if a list of required permits and approvals from agencies was included. For instance, "no dam shall be constructed in this state to impound water above the elevation of the natural surface of the ground for the purpose of creating a reservoir with a capacity of more than one hundred acre-feet of water or with a

116 surface area at the high water line in excess of twenty acres or if the height of the dam will exceed ten feet measured vertically from the elevation of the lowest point of the natural surface of the ground, where that point occurs along the longitudinal centerline of the dam, up to the flowline crest of the spillway of the dam before plans and specifications for that dam have been filed in the office of the state engineer and approved by him in accordance with regulations established by the state engineer governing such structures." (CRS 37-87-105, as amended)

117 The FEIS should briefly discuss the water rights and augmentation plans needed to replace loss of water or out-of-priority use of water caused by the following:

1. storage in sedimentation reservoirs;
2. interruption and use of spring flows by the operations; and,
3. inflows into the mine that are not returned to the natural drainage.

A court approved augmentation plan should be included as a mitigation measure in the FEIS.

The companies must have well permits to use ground water. This includes the use of water exposed during mining and seeping into the mine area.

Are there any ground water users near the project areas which might be affected by the proposed mining and dewatering? If so, how will these water users be protected from or mitigated for injury?

118 The FEIS should discuss the water supply for and impacts of the ancillary development created by the project.

119 The FEIS does not appear to comment on the possible effect of the Colorado River Compact on the project. While detailed comments are not appropriate, a general comment indicating that the Compact might influence future water use in the basin should be included.

120 We hope that Pacific has a firmer idea of what storage alternative they plan to use by the time they complete the FEIS. At a minimum, the FEIS should include discussion of the feasibility of the various alternatives.

121 Further discussion of the effectiveness of the various measures considered to prevent leachate infiltration or runoff is needed.

122 Page 3-27 states that the conveyance loss per 100 miles is 7% on the Colorado River. This estimate is reasonable for purposes of the EIS, but it should be stressed that any estimate of loss for a specific court case will be dependent upon the individual circumstances.

Wildlife

With a few exceptions, the wildlife sections of the document are complete and accurate.

123 The major general problem with the document is that it includes no committed mitigation for the wildlife impacts it describes. Without such mitigation, we feel the document is inadequate under Council on Environmental Quality and NEPA guidelines.

For instance, page 2-19 uses such correct descriptors as "diversified and locally variable, composed of a mosaic, multitude of microenvironmental conditions," and "diverse and varied vegetational landscape" to describe the existing environment. All these describe a very high quality wildlife habitat. We expect the impacts from this project to be severe and as such, these impacts must be mitigated by law.

Specific comments are as follows:

124 o Page 3-24, paragraph 6, how will hazardous waste be disposed of if an appropriate facility is not constructed?

125 o Page 3-25, paragraph 4. "Existing borrow areas . . . if possible." Extreme environmental impacts may occur if existing but unused limestone source is located near one of the states fish rearing facilities. Opening of this site would cause this agency many problems.

o Page 3-114-116, section 3.3.1.9. Strike the words "likely" and "probably" from this entire section. These impacts described are not likely, they are certain.

126 o Page 3-106, paragraph 2. What is meant by the term "stream temperature would be moderated in Main Elk Creek."?

127 o Page 3-115, first paragraph, last sentence. The words "and winter" should be added to ". . . is an important fall dietary component to deer."

128 o Page 3-180 to 186. This agency prepared an impact analysis jointly with the U.S. Fish and Wildlife Service in December 1983. We presented this to the project proponent and we feel this analysis is far superior to that used by Dames and Moore. We feel our analysis should be used in place of the Dames and Moore effort in the final EIS.

o Page 3-190, paragraph 2. A midstream diversion structure would obviously have less impact on the aquatic ecology of the river than the system proposed.

129 o Page 5-15, paragraph 3. We do not agree that ". . . increased numbers of people offer the opportunity to better manage the wildlife resource." This should be stricken from the EIS.

Natural Areas

The Colorado Natural Areas Program, Colorado Department of Natural Resources, and the U.S. Fish and Wildlife Service, Department of the Interior, have an existing cooperative agreement for plant conservation under Section 6 of the Endangered Species Act of 1973, as amended. By this agreement, CNAP is the state agency which is responsible for evaluating and protecting sites in Colorado which contain federally listed and Category 1 and 2 species of threatened and endangered plants through cooperative efforts with public land managing agencies and with private landowners.

The Program's Natural Heritage inventory contains site-specific data on elements of natural diversity of Colorado, including plant and animal species, aquatic ecosystems, and plant associations that are rare, endemic, disjunct, threatened throughout their range or in Colorado, vulnerable to extirpation in Colorado, or possibly threatened in Colorado. Inventory staff is responsible for evaluation of threatened and endangered plant populations and habitat in Colorado and for identification, evaluation, and ranking (in order of importance) of plant species and plant associations of special biological concern in Colorado.

130 The Mobil-Pacific Oil Shale DEIS adequately identifies and describes occurrences of federal candidate plant species and plant associations of special concern to Colorado on Mobil and Pacific property. Information contained in the DEIS should be revised to show that Thalictrum heliophilum is a Category 2 species (USFWS) requiring additional study prior to a final decision by USFWS to list the taxon as threatened or endangered. Although the DEIS includes Colorado Natural Heritage Inventory (CNHI) data obtained from various secondary sources, neither BLM-Grand Junction nor Dames and Moore, preparers of the DEIS, have requested current data on plant associations of special concern from CNHI. CNAP recommends that current CNHI data on plant associations of special concern be used in the analyses of impacts on vegetation from the proposed project.

Mitigation of Impacts/Conservation of Species:

CNAP agrees that project activities described in the DEIS will not affect any known populations of federally listed threatened or endangered plants. Information in the DEIS indicates that construction, operation and abandonment of the Mobil Project could result in elimination of 3,539 acres of existing vegetation and loss of individuals of some special plant species. CNAP supports the mitigation plan in the DEIS that all known occurrences of special-status species (including plants of special concern to Colorado) and of plant associations of special concern to Colorado should be avoided

131 by project activities "to the extent practicable" (4-151). Additional plant surveys should be performed by qualified botanists for areas which potentially will be disturbed and which have not been surveyed previously, Project impacts on individuals found through these surveys should be avoided to the extent practicable.

Most importantly, to ensure the long-term viability of plant species and plant associations of special concern in Colorado, CNAP recommends that project proponents protect a site (or sites) on their properties which contains the best assemblage of plant species and plant associations of special concern to Colorado. Preliminary evaluations of CNHI data by CNAP indicate that an area surrounding Chimney Rock contains a representative assemblage of plant species (including Sclerocactus glaucus - federal threatened) and plant associations of special concern to Colorado. Mobil and Pacific project activities are not planned for this area. CNAP will cooperate with Mobil and Pacific in further evaluations of the Chimney Rock area and/or other potential sites on Mobil and Pacific property to determine what conflicts may exist on these sites and to seek to resolve resource management issues associated with the sites so that the plant species and habitats can be protected.

CNAP is concerned particularly about the cumulative effects of industrial development in the Piceance Basin on federally listed or candidate plant taxa (e.g., Sclerocactus glaucus - federal threatened; Thalictrum heliophilum - Category 2). Most of the known habitat of Thalictrum heliophilum is on privately owned lands underlain by high grade oil shale reserves which are proposed for development. Similarly, CNAP has worked closely with BLM, USFWS, and proponents of the Getty-Cities Service-Chevron Shale Oil Project to develop and implement plant conservation measures which will ensure the continued viability of the greater De Beque population of Sclerocactus glaucus. Upon completion, the GCC project will extirpate more than 80% of the known individuals of Sclerocactus glaucus in the greater De Beque population.

Habitat protection and long-term population monitoring and field surveying are essential parts of a balanced plant conservation program for this region. Plant conservation efforts in Colorado will require the close cooperation of private landowners and federal and state agencies in the future. For example, remaining Sclerocactus glaucus populations in the greater De Beque area will require protection, given the magnitude of the cumulative effects of proposed oil shale projects. CNAP will work with Mobil and Pacific to identify, evaluate, and recommend areas on its property which may be considered

for protection of federally listed and candidate plant taxa and their habitats.

Soil Conservation

Site reclamation is well addressed concerning revegetation. The DEIS contains specifics such as seedbed preparation, ecological zones, timing of seeding, spreading of stockpiled topsoil, etc.

One factor, that will be difficult to deal with, is the "severe soil impact" of reduced soil depth to four inches, increased salinity to more than 8 mmhos/cm^2 and an erosion rate in excess of five tons per acre. It will be important to direct sediment laden water to sediment basins which are utilized with a maintenance program. During reclamation, topsoil will be spread to mitigate the problem of shallow soil, but it will be difficult to establish vegetation in saline soil and the need to select salt tolerant plant materials should be emphasized.

Information on erosion, in section 3.3.5.6 (surface water), indicates more critical erosion problems. The treatments are not definite enough to handle the proposed situation. To indicate that an attempt can be made to try these methods rather than attempting to revegetate slopes, is not good enough.

132 Water quality impacts from erosion and leaching of retorted shale embankments are forecast as having no significant impact to major degradation of water quality. The issue is dismissed by the statement that: "It is unlikely that high precipitation and runoff would occur concurrently on all the retorted shale embankments." Such a broad interpretation of environmental impacts indicates that the required testing has not been done. This leaves open the question of how the anticipated runoff and leachate will be handled.

Increased development pressure on cultivated land is noted. It is stated that land use plans and policies are being developed in affected areas in an attempt to preserve prime agricultural land. It is important that these policies are developed and implemented to mitigate the impact of development pressure on these agricultural lands.

Socioeconomics

The Mobil-Pacific Draft EIS provides a useful beginning for the development of a comprehensive impact mitigation strategy. Information presented in the socioeconomic sections of the document show a willingness for cooperation and a sensitivity to the problems encountered by local jurisdictions experiencing the swift changes of energy development. In order to provide for proper socioeconomic analysis and mitigation procedures based on mutual understanding, a number of omissions in this document must be remedied.

While the proposed impact mitigation sections contain a good outline (pages 3-177 through 3-180 for Mobil and Pages 4-153 through 4-156 for Pacific) of the principles of a fiscal mitigation strategy, the analysis of specific jurisdictions (pages 3-149 through pages 4-164 for Mobil and Pages 4 120 through pages 4-142 for Pacific) demonstrates that, while the county shows gross benefits due to the large increase in property tax assessed value, municipal fiscal health is dependent on severance tax direct distribution. Our inquiries have led to the discovery that no specific methodology and coefficient data have been provided, making it impossible to verify the assumptions behind such tables of numbers.

Capital facility expansion parameters, fiscal balances and capital expenditure needs were projected for these two projects using FISPLAN (pages 3-130 through 3-164 for Mobil and Pages 4-110 through 4-142 for Pacific). Again, no information has been provided to users or reviewers as to the assumptions behind the FISPLAN model projections. Detailed documentation of the specific revenue and expenditure coefficients used in generating the public finance projections are missing. (Please see the Revenue Coefficients Tables provided in the October, 1982 documentation of the CITF model as an example.)

133 In the "regional socioeconomic setting" section of the EIS (pages 2-26 through 2-65), it is suggested, with several specific examples, that existing facility capacities in Garfield and Mesa counties are adequate enough to handle growth related to a Mobil/Pacific scenario. While it is true that some surplus capacity does currently exist in these counties, it is inappropriate to speculate that the excess capacities are adequate, particularly if other oil shale projects currently being planned begin to have a cumulative impact in the area.

The document gives a very sketchy assessment of what the public facility and service needs might be in a cumulative scenario. It is stated on page 5-26 that many difficulties prohibit the projection of revenues and expenditures associated with high development scenarios "because impacts on public facilities and services cannot be determined by adding together the impacts as reported in several reports and EIS's because a surplus capacity that is only available once is used numerous times." While this statement is true, there are fiscal analysis models available that can address cumulative, rather than just project-specific impacts (such as the Fiscal Analysis Model developed as a result of CITF). However, once again, if the background material required by a user/reviewer in order to perform fiscal analysis is not made available within each EIS (or supporting documents), no cumulative assessment can be made.

In order to prepare all parties for the difficult fiscal analysis and mitigation efforts necessary to support these projects, a full

133 documentation of FISPLAN formulas and coefficients actually used to produce Table 3.3-17 and 4.3-20 should be made available as a formal attachment to the EIS.

Transportation

134 The document needs to address the impact of large oversized loads, both on the Colorado highway system and the county road system. This type of shipment is becoming increasingly regular and has the potential for significantly damaging roadways and bridges as energy development in western Colorado increases. The document should give some indication of potential routes, weights, sizes, and lengths of any greatly oversized loads anticipated with either project as well as the approximate year of shipment or movement into Colorado. It would also be the company's responsibility to pay for the costs and/or damages to the state highway system incurred by moving these loads.

Tables 3.3-19 and 4.3-22 should show projected traffic volumes as well as the cumulative traffic impact of the two projects. There should also be a discussion of the impacts to the county road system in terms of projected traffic volumes on Roan Creek Road, Colorado River Bridge from Interstate 70 into De Beque and local streets.

135 This document indicates that these two specific projects will not have a significant adverse effect on the major transportation systems serving the energy development area. However, the document also indicates that the cumulative impacts resulting from the development of six oil shale projects will have both significant and adverse impacts on the transportation systems serving the oil shale development area between De Beque and Rifle. Yet, a specific transportation mitigation section is omitted from the Mobil discussion and Section 4.3.4.15 of the Pacific discussion states that "No [transportation] mitigative measures are recommended." This document needs to provide a more complete discussion of the cumulative impacts as well as a commitment to mitigation measures for the share of cumulative transportation impacts created by each project.

A sincere effort needs to be made at the state and federal levels to identify these cumulative impacts as well as establish a funding source to provide future mitigation payments for improvement, expansion, and repair of the transportation systems serving the area receiving intensive energy development. Reviewing specific energy development proposals one at a time does not result in a realistic evaluation of the total impacts the energy development area will receive and consequently will not result in the proper mitigation of the cumulative impacts.

Historic Preservation

Potential impacts to cultural resources have been adequately considered.

Social Services

136 On page 2-54 the Draft states, "Numerous service agencies staffed by trained professionals exist in both counties" but the lead-in refers to "increased social problems" without distinguishing between potential new problems, which would require developing new programs, and increases in old problems, for which there are already techniques. Regarding social services, a more informative observation would be that rapid growth will probably not introduce any new social service problems but will increase, possibly disproportionately, current social service problems, problems for which there are well established procedures. So the impact of the projects will be to require additional resources but not new programs. Under current statutes, the bulk (approximately 80%) of the additional resources will be provided by the state; however, due to the constraints of the budget/allocation process, some resource allocation may lag behind the need by as much as a year and the Draft should be more explicit as to the need for the county to develop a plan to cope with the lag. Even better than synchronizing additional resources with increased case loads, would be to anticipate the increased activity and hire in anticipation of the actual need. Since this may require greater proportional county funding than for usual operations, our experience is that the issue should be raised as early as possible and presented in great detail.

The Draft may also cause some confusion by mentioning (page 2-53) the Mesa County Department of Social Services but not the Garfield County Department, when it is the Garfield County Department that will bear the brunt of the increase.

Education Resources

The information presented in regard to public school districts is satisfactory.

STATE OF COLORADO RICHARD D. LAMM, Governor
DEPARTMENT OF NATURAL RESOURCES
DAVID H. GETCHES, Executive Director
1313 Sherman St., Room 718, Denver, Colorado 80203 866-3311

Geological Survey
Board of Land Commissioners
Mined Land Reclamation
Division of Mines
Oil and Gas Conservation Commission
Division of Parks & Outdoor Recreation
Soil Conservation Board
Water Conservation Board
Division of Water Resources
Division of Wildlife

May 17, 1984

Mr. Phil Neal
U.S. Bureau of Land Management
Grand Junction District
764 Horizon Drive
Grand Junction, Colorado 81502

Dear Phil:

As noted in the air quality comments on the Draft Mobil-Pacific EIS (sent May 8, 1984), here are the Air Pollution Control Division's suggestions for analyzing cumulative impacts at Colorado National Monument.

Please consider these additional comments as part of the state's response to the Mobil-Pacific EIS.

Thank you.

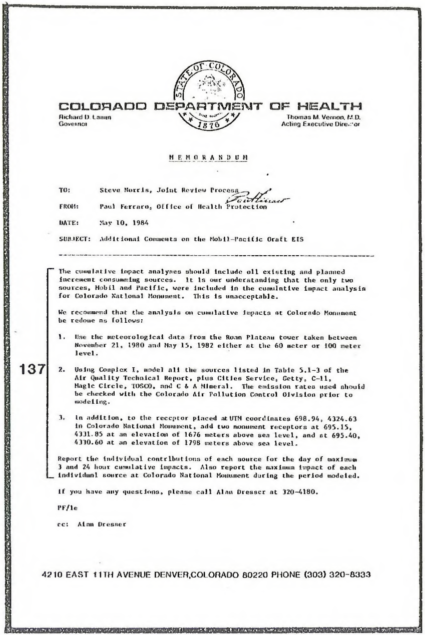
Sincerely,

Steve

STEVE NORRIS
Project Manager
Colorado Joint Review Process

SN:ljc
Attachment

RECEIVED 21 1984



COLORADO DEPARTMENT OF HEALTH
Richard D. Lamm
Governor
Thomas M. Vernon, M.D.
Acting Executive Director

1876

M E M O R A N D U M

TO: Steve Norris, Joint Review Process

FROM: Paul Ferraro, Office of Health Protection

DATE: May 10, 1984

SUBJECT: Additional Comments on the Mobil-Pacific Draft EIS

---

137 The cumulative impact analyses should include all existing and planned increment consumming sources. It is our understanding that the only two sources, Mobil and Pacific, were included in the cumulative impact analysis for Colorado National Monument. This is unacceptable.

We recommend that the analysis on cumulative impacts at Colorado Monument be redone as follows:

1. Use the meteorological data from the Roan Plateau tower taken between November 21, 1980 and May 15, 1982 either at the 60 meter or 100 meter level.
2. Using Complex I, model all the sources listed in Table 5.1-3 of the Air Quality Technical Report, plus Cities Service, Getty, C-11, Magic Circle, TOSCO, and C & A Mineral. The emission rates used should be checked with the Colorado Air Pollution Control Division prior to modeling.
3. In addition, to the receptor placed at UTM coordinates 698.94, 4324.63 in Colorado National Monument, add two monument receptors at 695.15, 4331.85 at an elevation of 1676 meters above sea level, and at 695.40, 4330.60 at an elevation of 1798 meters above sea level.

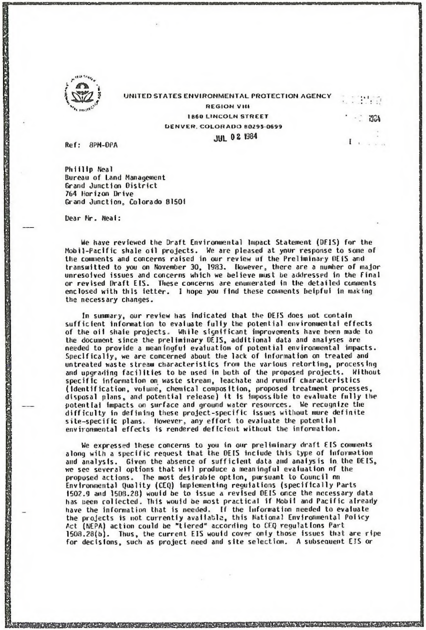
Report the individual contributions of each source for the day of maximum 3 and 24 hour cumulative impacts. Also report the maximum impact of each individual source at Colorado National Monument during the period modeled.

If you have any questions, please call Alan Dresser at 320-4180.

PF/le

cc: Alan Dresser

4210 EAST 11TH AVENUE DENVER,COLORADO 80220 PHONE (303) 320-8333



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
1860 LINCOLN STREET
DENVER, COLORADO 80295-0699

JUL 02 1984

Ref: 8PM-DPA

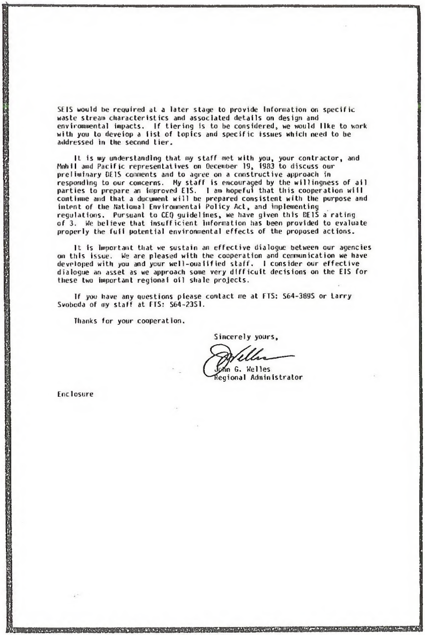
Phillip Neal
Bureau of Land Management
Grand Junction District
764 Horizon Drive
Grand Junction, Colorado 81501

Dear Mr. Neal:

We have reviewed the Draft Environmental Impact Statement (DEIS) for the Mobil-Pacific shale oil projects. We are pleased at your response to some of the comments and concerns raised in our review of the Preliminary DEIS and transmitted to you on November 30, 1983. However, there are a number of major unresolved issues and concerns which we believe must be addressed in the Final or revised Draft EIS. These concerns are enumerated in the detailed comments enclosed with this letter. I hope you find these comments helpful in making the necessary changes.

In summary, our review has indicated that the DEIS does not contain sufficient information to evaluate fully the potential environmental effects of the oil shale projects. While significant improvements have been made to the document since the preliminary DEIS, additional data and analyses are needed to provide a meaningful evaluation of potential environmental impacts. Specifically, we are concerned about the lack of information on treated and untreated waste stream characteristics from the various retorting, processing and upgrading facilities to be used in both of the proposed projects. Without specific information on waste stream, leachate and runoff characteristics (identification, volume, chemical composition, proposed treatment processes, disposal plans, and potential release) it is impossible to evaluate fully the potential impacts on surface and ground water resources. We recognize the difficulty in defining these project-specific issues without more definite site-specific plans. However, any effort to evaluate the potential environmental effects is rendered deficient without the information.

We expressed these concerns to you in our preliminary draft EIS comments along with a specific request that the DEIS include this type of information and analysis. Given the absence of sufficient data and analysis in the DEIS, we see several options that will produce a meaningful evaluation of the proposed actions. The most desirable option, pursuant to Council on Environmental Quality (CEQ) implementing regulations (specifically Parts 1502.9 and 1508.28) would be to issue a revised DEIS once the necessary data has been collected. This would be most practical if Mobil and Pacific already have the information that is needed. If the information needed to evaluate the projects is not currently available, this National Environmental Policy Act (NEPA) action could be "tiered" according to CEQ regulations Part 1508.28(b). Thus, the current EIS would cover only those issues that are ripe for decisions, such as project need and site selection. A subsequent EIS or



SEIS would be required at a later stage to provide information on specific waste stream characteristics and associated details on design and environmental impacts. If tiering is to be considered, we would like to work with you to develop a list of topics and specific issues which need to be addressed in the second tier.

It is my understanding that my staff met with you, your contractor, and Mobil and Pacific representatives on December 19, 1983 to discuss our preliminary DEIS comments and to agree on a constructive approach in responding to our concerns. My staff is encouraged by the willingness of all parties to prepare an improved EIS. I am hopeful that this cooperation will continue and that a document will be prepared consistent with the purpose and intent of the National Environmental Policy Act, and implementing regulations. Pursuant to CEQ guidelines, we have given this DEIS a rating of 3. We believe that insufficient information has been provided to evaluate properly the full potential environmental effects of the proposed actions.

It is important that we sustain an effective dialogue between our agencies on this issue. We are pleased with the cooperation and communication we have developed with you and your well-qualified staff. I consider our effective dialogue an asset as we approach some very difficult decisions on the EIS for these two important regional oil shale projects.

If you have any questions please contact me at FTS: 564-3895 or Larry Svoboda of my staff at FTS: 564-2351.

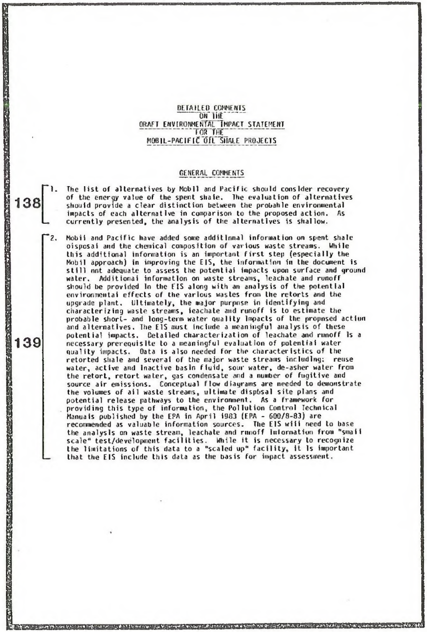
Thanks for your cooperation.

Sincerely yours,

JGWelles

John G. Welles
Regional Administrator

Enclosure



DETAILED COMMENTS
ON THE
DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE
MOBIL-PACIFIC OIL SHALE PROJECTS

GENERAL COMMENTS

138 1. The list of alternatives by Mobil and Pacific should consider recovery of the energy value of the spent shale. The evaluation of alternatives should provide a clear distinction between the probable environmental impacts of each alternative in comparison to the proposed action. As currently presented, the analysis of the alternatives is shallow.

139 2. Mobil and Pacific have added some additional information on spent shale disposal and the chemical composition of various waste streams. While this additional information is an important first step (especially the Mobil approach) in improving the EIS, the information in the document is still not adequate to assess the potential impacts upon surface and ground water. Additional information on waste streams, leachate and runoff should be provided in the EIS along with an analysis of the potential environmental effects of the various wastes from the retorts and the upgrade plant. Ultimately, the major purpose in identifying and characterizing waste streams, leachate and runoff is to estimate the probable short- and long-term water quality impacts of the proposed action and alternatives. The EIS must include a meaningful analysis of these potential impacts. Detailed characterization of leachate and runoff is a necessary prerequisite to a meaningful evaluation of potential water quality impacts. Data is also needed for the characteristics of the retorted shale and several of the major waste streams including: reuse water, active and inactive basin fluid, sour water, de-asher water from the retort, retort water, gas condensate and a number of fugitive and source air emissions. Conceptual flow diagrams are needed to demonstrate the volumes of all waste streams, ultimate disposal site plans and potential release pathways to the environment. As a framework for providing this type of information, the Pollution Control Technical Manuals published by the EPA in April 1983 (EPA - 600/8-83) are recommended as valuable information sources. The EIS will need to base the analysis on waste stream, leachate and runoff information from "small scale" test/development facilities. While it is necessary to recognize the limitations of this data to a "scaled up" facility, it is important that the EIS include this data as the basis for impact assessment.

140 3. The EIS should discuss the timing and process for obtaining the required 404 Dredge and Fill permit for each project. EPA and the Corps of Engineers have developed guidelines (40 CFR Part 230) for the review of Dredge and Fill Permit applications as required by Section 404 of the Clean Water Act. As described in Subpart B of the guidelines, four conditions must be satisfied to make a finding that a proposed discharge of dredge or fill material complies with the guidelines and that discharge of fill material may be permitted. First, alternatives must be considered to determine that the proposed plan would have the least adverse impact on the aquatic ecosystem. Second, a discharge is not permitted if it would result in violation of State water quality standards, toxic effluent standards, effluent guidelines under Sec. 307 of the Clean Water Act, or jeopardize endangered species. Third, based on appropriate factual determinations, evaluations, and tests, it must be demonstrated that the proposed action would not cause or contribute to significant degradation of water quality which would have significant adverse effects on (a) human health or welfare, (b) life stages of aquatic life and wildlife dependent on aquatic ecosystems, (c) aquatic ecosystem diversity, productivity, and stability, and (d) recreational, aesthetic, and economic values. Fourth, appropriate and practical steps must be taken to minimize the potential adverse impacts of the discharge on the aquatic ecosystem. Without complete chemical composition data for spent shale pile runoff and leachate and a full analysis of potential water quality impacts, it is not possible to make the determination required by the National Environmental Policy Act or 404(b)(1) guidelines. This data is required specifically to demonstrate whether the spent shale piles would contribute to degradation of water quality which would adversely affect human health and aquatic ecosystem. The DEIS does not provide sufficient information to evaluate the issues required by the NEPA and 404(b)(1) Guidelines, and it is therefore not possible to evaluate fully the potential environmental effects of the proposed actions or alternatives. Section 230.12(a) of the Section 404(b)(1) Guidelines requires that a site be specified as failing to comply with the Guidelines if sufficient information does not exist to make a reasonable judgement about compliance with the Guidelines with subsequent denial of the permit. It is, therefore, important to discuss the relationship between the 404 permit requirements and this NEPA action. Regardless of the status of the 404 permit process the EIS must include a meaningful analysis of potential water quality impacts to both surface and ground water resources in the area.

141 4. There is some inconsistency between Mobil and Pacific as to whether some alternatives are reasonable. For example, mining methods considered reasonable by Pacific are not considered reasonable by Mobil even though the position and nature of the resource are similar. Of more significance is the return of spent shale to the underground mine for disposal. Pacific rates this alternative reasonable (page 4-34) while Mobil rates it as unreasonable due to technological and economic problems (page 3-38).

142 5. Very large differences appear to exist between the Mobil project and the Pacific project in terms of air emissions (table 3.3-1, page 3-34 vs table 4.3-1, page 4-72). Since both projects are designed to produce 100,000 bbl/day such large differences (approximately 200%) are difficult to understand. Differences in retorting technology are not reasonable excuses for such large differences. Since the environmental impacts were based on models using these emission values, the document should include a discussion of the major difference between the two projects.

143 6. There did not appear to be any data on VOC emissions from wastewater or oily water treatment systems. The potential for volatile emissions from the retorted shale disposal site was not discussed. The transfer, handling and disposal of the retorted shale could cause some problems of particulate entrainment and/or hydrocarbon vaporization from the hot shale. A study by Schmidt-Collerus (NSF GI 34282X1 (RANN) National Science Foundation, Washington, D.C., 1974) identified polynuclear, aromatic hydrocarbons in the air at a shale disposal site. These compounds could present significant risk to worker and public health. Recent studies at the University of Colorado (Department of Chemistry, Ph.D Thesis, Steven O. Hawthorne) have apparently confirmed earlier reports. The DEIS should include an evaluation of this potential problem, including monitoring and mitigation.

144 7. The Mobil project does not discuss the possible use of the Unishale C process. The difference in potential environmental impacts between the Unishale B and Unishale C retorting technologies appears to be significant. The characteristics and physical properties of waste streams, retorted shale and leachate and runoff water will be substantially different for the Unishale C process. It is, therefore, important to evaluate fully the potential environmental impact of the project using the Unishale C if the technology is being considered.

SPECIFIC COMMENTS

145 1. Page 1-23. The low and high level development scenarios are not very realistic or useful in evaluating overall impacts. The low level scenario is too low since it assumes that only Union's existing 10,000 bbl/day plant would be built in addition to either the Mobil or Pacific project. It appears very likely that with support from the Synthetic Fuels Corporation, several plants will be built. Cathedral Bluffs appears very likely along with one or more of Union Phase II, Cottonwood Wash, Seep Ridge (Geokinetics) and, without SFC support, White River. The high level scenario is unrealistic since it considers only developments in Colorado (and too many of these) while ignoring developments in Utah. The EIS should discuss the rationale behind the selection of the high and low scenarios.

146 2. Page 2-15. The ground water in portions of the basin other than the margins varies substantially. Even in the center of the basin some ground waters are of acceptable quality for some uses and should not be described universally as "very poor". Discussion of water quality must recognize that ground water at the project sites is high quality and is not indicative of lower quality water found in other parts of the basin.

147 3. Page 2-14 to 2-17. A map is needed to show the general geologic structures which will affect ground water flow in the area. The map should also show the possible effect of these structural features on the potential ground water effects of the proposed action and alternatives. None of the maps found on pages 2-16 to 2-17 show the actual ground water flow direction in relation to the project locations. In addition, the discussion of ground water recharge should be expanded to focus on the location of recharge areas and any possible effects on these areas.

Chapter 3 - The Mobil Project

148 4. Page 3-15. The leachate data from spent shale tested at Anvil Points using the Paraho retort should not be used alone to predict impacts from leachate. Mobil should use this information along with data from the other proposed retorting technologies to develop a realistic mix of retorted shales from the proposed action. Further, EPA sponsored studies at Colorado State University indicate that batch leaching of spent shales by either the EPA EP test or the ASTM distilled water test provide misleading results. Actual field leachates tend to have higher concentrations of pollutants. It is suggested that Mobil coordinate future tests with EPA and the CMLRD to obtain maximum benefit and acceptability from the results. The difficulty in modelling the potential effects of leachate is compounded by the proposed use of different retorting technologies. However, for the Mobil project some method of aggregating the various leachate data will have to be developed.

149 5. Page 3-15. The chemical composition data on waste streams and leachate needs clarification, supporting documentation and additional information and analysis. The EIS includes no data on priority pollutants known to exist in most waste streams. Further, there is no mention of arsenic content which is usually found in a number of the major oil shale process waste streams. The report that no toxic organics are present in leachate conflicts with other reports. This information needs to be improved considerably for both projects and used as a basis for a meaningful analysis of the potential water quality impacts of the proposed actions and alternatives.

150 6. Page 3-15. The document should discuss the significance of the fact that the processed shale has the capacity to absorb more water.

151 7. Page 3-16. A more detailed discussion is needed on the goals or proposed design criteria. The document should specify how the goals will be achieved realistically.

152 8. Page 3-16. What volume of retorted shale will be placed in Cabin Water and Middle Water gulches? The EIS should include conceptual specifications on pile design including volume, depth, surface area, etc. Further, it would be helpful to provide additional information on the gradient of the land versus proposed pile depth.

153 9. Page 3-18. The water balance of the retorted shale piles needs considerable improvement. This is true for both of the projects. On a yearly basis, evaporation exceeds precipitation. However, during shorter periods of observation there are times when precipitation occurs with sufficient intensity and duration to cause significant moisture infiltration into the pile. This will be true during both pile construction and the post-operational era. The water balance of the piles should be calculated realizing the frequent flux of moisture into the pile and the contribution of this moisture flux in the generation of leachate. The discussion and analysis should consider the effects of unsaturated flow and downward flux resulting from short-term precipitation events. Further, a more detailed description of the proposed seepage collection system is warranted.

154 10. Page 3-18. Mobil proposes an impervious barrier below the spent shale fill. What does Mobil consider impervious? 10-7 cm/sec. is often considered impervious but is difficult to achieve with many spent shales. Does Mobil plan to place a drain on top of the impervious layer so that moisture will not collect to cause mass failure? How would spent shale from different retorting processes be used to best advantage in disposal pile design?

155 11. Page 3-19. All dams will be removed after the final revegetation of the Wheeler Gulch embankment. The potential long-term water quality impacts must be assessed for this post operational era. This comment also applies to the Pacific project. The document should discuss the long-term abandonment plans for the projects and the conceptual plans necessary to minimize long-term environmental effects.

156 12. Page 3-19. What is the probable maximum precipitation event for which water control structures are designed?

157 13. Page 3-19. A diagram showing the source, volume, treatment and destination of each major aqueous waste stream would be helpful.

158 14. Pages 3-20 to 3-21. The addition of Tables 3.1-3 and 3.1-4 is very helpful. However, the large volume of "dust" should be explained in the document.

159 15. Page 3-23. Mobil is to be commended for the plans to use biological oxidation in treating waste waters. It would be helpful to include additional conceptual plans for this treatment method.

160 16. Page 3-32. It does not seem logical that Mobil will import natural gas to meet electrical needs while disposing of large amounts of energy in the form of carbon on the Union B and TOSCO spent shales. Is Mobil committed to not using this energy source? If Mobil burns the carbon for energy, then to what extent will air emissions be increased as compared to using imported natural gas?

161 17. Page 3-39. The alternative of retorted shale disposal in the mined areas should be addressed.

162 18. Page 3-41. Transportation of processed shale from the retorts to Wheeler Gulch by truck would appear unreasonable due to: fugitive dust from trucks, high energy cost, road difficult to maintain in bad weather. It is noted, however, that Mobil's proposed action is transport by covered conveyor which will have less impact on the environment than transport by truck.

163 19. Page 3-50. It would seem that on-site use of the carbon on the TOSCO II and Union B spent shales may be an alternative to importing natural gas via a pipeline. Union is investigating this alternative and Mobil should consider it.

---

164 20. Page 3-62. The document should include additional information on springs and seeps and the possible effect of mine dewatering and waste disposal on those water sources.

165 21. Page 3-99. Raw Shale Handling. If leachate from the raw shale stockpile is not prevented from entering the ground water or surface water systems, impacts to water quality will occur. Raw shale leachates may have very high levels of dissolved solids .

166 22. Pages 3-99 to 3-102. Waste Disposal. Drains should be provided both above and below the compacted spent shale liner. The drains below the pile would prevent saturation of the pile bottom from ground water intrusion. The drains above the liner would channel any leachate to the collection pond. Failure to include such drains could lead to pile failure. These considerations apply to all three disposal sites. Such measures are suggested by BLM (page 3-172).

167 23. Page 3-106. Spill Risks. The EIS states "this translates to an average annual loss of 28 barrels of oil along the 10 mile route to the LaSal Pipeline Terminal". It does not appear meaningful to use national averages to predict spills on a 10-mile pipeline. A more realistic approach would be to discuss the impacts of an average size spill from a 100,000 bbl/day pipeline. .

168 24. Pages 3-172 to 3-173. The mitigation methods outlined for ground water and surface water are excellent suggestions. The document should discuss the applicability and effect of these measures on each of the alternatives and proposed actions.

169 25. Page 3-172. The use of alternate retorting methods that produce decarbonized shale may substantially reduce the erosion rate of the spent shale fill. Likewise the option of burning the carbon off the spent shale from the proposed Union B or TOSCO retorts could accomplish the same thing. Overall mass stability of the disposal pile would also be increased due to the cementing nature of decarbonized shales. Revegetation on the other hand would be more difficult and more sparse. Though this obvious alternative was pointed out during earlier reviews, it still is not discussed.

Section 4 - The Pacific Project

170 26. The proposed mining plan employing room and pillar mining, 64 foot square pillars and mining of 62 per cent of the rock in the mined interval will likely lead to pillar failure and collapse of overburden. Generally, based on experience with other mining industries, pillars less than 100 feet square and removal of over 50% of the rock lead to pillar failure. Note that Mobil, Union, and Colony do not propose such small pillars or high removal rate. If Pacific can substantiate the long-term stability of 64-foot pillars 60 feet high, then such evidence should be provided in the EIS.

171 27. Page 4-11. Pacific proposes to either retort the raw shale fines or store them in worked out mine panels. This approach is much more resource conservative than wasting the fines with the spent shale as proposed by others (Cathedral Bluffs). Pacific is to be commended.

172 28. Page 4-19. Pacific proposes 50 foot wide benches every 150 vertical feet and an overall 2 to 1 slope on the front face of the spent shale disposal pile. This slope would seem too steep to prevent erosion and maintain vegetation. This is further impacted by the 150 rises between benches. Fifty foot rises would reduce erosion as would 4 to 1 overall slopes.

173 29. Page 4-19. Pacific does not mention the use of drains above and below the compacted impervious spent shale liner. If drains are not included, then moisture may collect and lead to mass failure of the pile. This risk is briefly acknowledged on page 4-87.

174 30. Page 4-36. The alternative of locating the entire plant on the mesa top would have significant advantages in dispersing, rather than trapping, air pollutants. This should be seriously considered as a preferred alternative.

175 31. Page 4-40. The document should categorize wastes into those streams covered under the RCRA and those wastes exempted under the mining waste exemption. Further, some discussion should be given on the process used to identify any hazardous wastes generated during the retorting and upgrading processes. Specifically, the wastes from the upgrade plant should be evaluated within the context of RCRA, the mixture rule and possible restrictions due to co-disposal of hazardous waste with exempted or non-hazardous materials.

176 32. Page 4-87. Raw shale stockpiles will produce a leachate with high levels of dissolved solids that can adversely impact surface water and groundwater quality if not properly contained.

177 33. Page 4-87. Pacific fails to mention any drains above or below the spent shale pile liner. Failure to provide such drains can result in increased production of leachate as ground water or buried springs saturate the bottom of the pile. More catastrophic would be pile failure due to water build up above or below the liner. Such drains are discussed in Section 4.3.5 "Mitigation" (page 4-150) but are not discussed as part of the proposed action or alternatives.

178 34. Page 4-87. The water balance of the retorted shale piles needs considerable improvement. This is true for both of the projects. On a yearly basis, evaporation exceeds precipitation. However, during shorter periods of observation there are times when precipitation occurs with sufficient intensity and duration to cause significant moisture infiltration into the pile. This will be true during both pile construction and the post-operational era. The water balance of the piles should be calculated realizing the freouent flux of moisture into the pile and the contribution of this moisture flux in the generation of leachate. The discussion and analysis should consider the effects of unsaturated flow and downward flux resulting from short-term precipitation events. Further, a more detailed description of the proposed seepage collection system is warranted.

179 35. Page 4-150. Methods to reduce the excessive erosion rate that would occur on the face of the spent shale pile embankment are discussed. However, these alternatives are not included in the proposed action or alternatives.

Section 5 - Cumulative Impacts

180 36. Page 5-3. The maximum predicted cumulative SO_2 and particulate (TSP) concentrations in Regional Class I areas do not appear reasonable and consistent with the expected concentrations based on other similar projects. The EIS should provide a breakdown by source (plant/development) and provide the text reference for the individual impacts of each plant under given wind conditions and then present the total cumulative impact to justify the figures presented.

181 37. Page 5-4. The cumulative air quality analysis should include the location of both the Mobil and Pacific projects and other major sources in the region including the Gary Western refinery.

182 38. Page 5-10. The cumulative impact analysis will need to be reevaluated on the basis of the air and water quality impact assessments discussed in previous comments. Specifically, the surface and ground water portions of the cumulative impact assessment will need to be analyzed and presented.

183 39. Page 5-10. The cumulative impact section should also discuss the overall effect of disrupting the Mahoganey Zone which serves as a major aquitard in the region. Possible means of monitoring and mitigation of subsidence should also be discussed.

Air Quality Technical Report

GENERAL COMMENTS

40. The review of the EIS and Air Quality Technical Report reveals some issues that need further clarification or additional analysis.

184 A.] The technical report claims that the highest TSP impact from the Pacific facility occurs during light winds and stable conditions. This may be true for elevated plumes, but (there was no indication that) windy neutral conditions were modelled to determine the impact of fugitive TSP sources.

185 B.] In the Pacific Class II analysis, the maximum three hour, 24 hour and annual impacts of SO_2 and NO_x occur at the same receptor. It is unusual for the highest short-term impacts to occur at the same receptor locations as the highest annual impact. This could occur if the receptor grid network were sparse, but there is no indication of receptor location choice throughout the report. The document needs to discuss this matter in greater detail.

186 C.] The Pacific facility was modelled for cummulative Class II impacts using the Box Model. In this model, the Chevron Retort facility emissions should have been included in the Clear Creek drainage flow along with the Pacific emissions. The report's conclusion that the Pacific emissions alone cause the highest cummulative impact is probably incorrect. This would mean that the 24-hour, Class II PSD increments for SO_2, and TSP are exceeded to a larger extent than predicted in the document if the additional sources are included.

187 D.] The long range transport analysis to the Mt. Zirkel Wilderness Class I area did not include any annual impact estimate for SO_2, TSP, or NO_x. This is true for both the individual Mobil and Pacific facilities and the cumulative analysis. The annual long-range transport modelling with Complex I was performed to address acid deposition in the Mt. Zirkel Wilderness area but should also evaluate the Class I PSD impacts.

188 41. General. It would be useful if information were provided on the accuracy, strengths, and the weaknesses of the various models cited.

189 42. Page 3-13. Air quality data was collected from November, 1981 through May, 1982. Hence; there are no data for summer months. This is a serious limitation. Data should have been collected for at least a full year.

PUBLIC HEARING

MOBIL/PACIFIC OIL SHALE DRAFT ENVIRONMENTAL IMPACT STATEMENT

April 16, 1984

New Castle, Colorado

CERTIFICATION

I do hereby certify that the foregoing is a true and correct copy of the minutes of a Public Hearing on the Mobil/Pacific Oil Shale Draft Environmental Impact Statement on April 16, 1984, in New Castle, Colorado.

Dorothy Coakley

Dorothy Coakley

LARRY PORTER: On April 16, 1984, in Newcastle, Colorado, a public hearing commenced on the Mobil/Pacific Oil Shale Draft Environmental Impact Statement, or EIS. The purpose of the hearing is to receive comments from the public on the adequacy of the draft EIS. By way of background on how we got to this point tonight where we are conducting this hearing, there was a round of information mettings back in the fall of 1982 which Mobil and the Pacific partners put on in Colorado detailing their project proposals. Then early in 1983 the Bureau of Land Management held a series of public scoping meetings both for the general public and with other federal agencies and local and state governments to develop issues which we would look at in this Environmental Impact Statement. We then prepared a draft of the Environmental Impact Statement which was released the first week of March, 1984, and comments on the draft EIS will be received by the BLM until May 4, 1984, and they may be delivered either verbally at our open hearings or delivered to us in writing before that time.

This draft EIS was prepared in cooperation with several other federal agencies who look to it to satisfy their permitting and licensing requirements. There are six co-operators with BLM on this draft Environmental Impact Statement. They are: the Environmental Protection Agency, the U.S. Fish and Wildlife Service, Department of Energy, Naval Oil Shale Reserve, National Park Service, U.S. Forest Service, U. S. Army Corps of Engineers. The comments should focus on whether logical and appropriate alternatives to the performance proposal would develop, how those alternatives were analyzed, whether the impacts were analyzed, identified properly and the overall adequacy of those impact analyses. At this time we have no speakers who have signed up on the roster to present formal testimony to hearing tonight. I would like to give any people present at this time the opportunity to do that formally in this hearing, which would be part of the public hearing record on this EIS. We have no one who is proposing to present comment at this time.

EARL DAWSON: I have a question. If this proposal all goes through, and they get all their permits and it does happen, then if the oil shale thing falls like Exxon did, what are you going to do with all that water?

LARRY PORTER: Well, Mr. Dawson, we have discussed several of these topics on other occasions, but what I didn't get far enough into my general discussion this evening because we don't have any speakers who want to present formal comment to the hearing, but what I was going to say later, is that since the purpose of this meeting is to receive formal public comment, there are questions that some of you present might have and we would be happy to discuss those questions after the meeting and if we don't have the answers we can put you in touch with someone who does, and hopefully these questions would be directed toward helping us or helping you put together comments which you could deliver to us on the Environmental Impact Statement. Would that satisfy your needs, if we were to meet with you a few minutes after the meeting, Mr. Dawson?

EARL DAWSON: Yeah, that's fine. You asked for comments now is what you did, otherwise I was going to wait until these guys get their program going but you asked for the comments now so that is why I responded.

LARRY PORTER: Yes, and then the purpose definitely is for receiving comments on the adequacy of the Environmental Impact Statement tonight, so if anyone present have comments which are directed towards that topic then I'll receive them now and we will put them into the hearing record; if not, people can give those comments to us in writing by addressing them to: Mr. Phillip Neal, EIS Team Leader at BLM Grand Junction District Office, and we will address those comments in the final Environmental Impact Statement. They will be given the same weight whether they are delivered in public at a hearing or given to us in written comments. So if, I see a gentlemen who has just come in now, if anyone has formal comments they would like to present for the record on the adequacy of the EIS right now at this hearing we will receive

them. If not, is there anyone who would like to do that?

EARL DAWSON: Bill Gregg is well versed on it. How come in their Environmental Impact Statement did they declare that Mobil Oil owns and leases all the property that is within the reservoir site?

LARRY PORTER: Well, Mr. Dawson, do you want to come up in front and make some comments for the record? If you do, there are certain things we can accept into the record and we'll respond to them as comments on the EIS, but if there are other things that are outside of the analysis that was done in there...

EARL DAWSON: That was in the analysis, and if you did not bring us answers then we might as well leave because--

LARRY PORTER: If that is a comment on the analysis then I'll accept that in the record as a comment on the analysis.

EARL DAWSON: It's definitely in there in black and white if you want me to read it out--

LARRY PORTER: No, would you state that for the record, then, Mr. Dawson? We do like for the public record for your name and address.

190 EARL DAWSON: My name is Earl Dawson, Newcastle, Colorado, and it is definitely stated in your Impact Statement. Okay. This is what it reads:

> "There are three major properties that are included in Mobil's Project. The 'Parachute block' of oil shale reserves is approximately 10,000 acres in area and is located north and northeast of Parachute. The Mahaffey ranch, about 1,420 acres, straddles Interstate 70 and the Denver & Rio Grande Western Railroad, and fronts the Colorado River. The Main Elk Reservoir site, a 1,350-acre tract, is the proposed location of a dam and a 35,000-acre-foot reservoir, and is 4 miles northeast of the town of New Castle. At the present time, Mobil owns, manages and supervises these properties. There are some leases on them which include rights to graze livestock, some of which are operable year-round and some of which are seasonal."

And this is a damn lie. They do not own our property. We have three acres in our home that we have owned for thirty-five years. And if there is any doubt about it, it is listed in the Garfield County tax book. I don't have the page

190 tonight. They do not own the property. That woman sitting right back there and I own and have the deed to it. Mobil Oil does not own it.

LARRY PORTER: For the purpose of this hearng tonight, Mr. Dawson, I'll accept that as a comment on the Environmental Impact Statement and will enter your comment into the record.

EARL DAWSON: It's went farther than that.

LARRY PORTER: Okay. Thank you for your comment. Are there any others here present tonight who would like to make a comment for the public record? What page in the EIS was Mr. Dawson reading from?

"3-81"

LARRY PORTER: Well, I certainly want to thank those of you who have come out this evening. We appreciate you showing up. I'm going to wait one minute. Phil? Okay. I had an indication that the people just arriving do not want to speak for the record this evening. I would appreciate it it all of you would sign the attendance roster as you leave. It does help us with our participation records, and I also want to remind you that you have until May 4, 1984, to submit written comments to the BLM District office in Grand Junction, and we will look at those when we are looking at the adequacy of the Environmental Impact Statement and address those comments as we prepare the final Environmental Impact Statement which you should expect to receive about when, Phil? For the final

EIS, what are we looking at schedule-wise?

PHIL NEAL: Approximately the end of July.

LARRY PORTER: Okay, if there are no further questions or comments, then I would like the record to show that at 7:12 p.m. this public hearing in New Castle, Colorado, on the Mobil Pacific Oil Shale Environmental Impact Statement was concluded and I thank you very much. Once again, if any of you have any questions, please feel free to come up and get with us after this meeting.

PUBLIC HEARING
MOBIL/PACIFIC OIL SHALE DRAFT ENVIRONMENTAL IMPACT STATEMENT
April 17, 1984
Parachute, Colorado

CERTIFICATION

I do hereby certify that the foregoing is a true and correct copy of the minutes of a Public Hearing on the Mobil/Pacific Oil Shale Draft Environmental Impact Statement on April 17, 1984, in Parachute, Colorado.

Dorothy Coakley
Dorothy Coakley

LARRY PORTER: The meeting is called to order and I would like the record to show that at 7:10 p.m. on April 17, 1984, in Parachute, Colorado, a public hearing commenced on the Mobil/Pacific Oil Shale Draft Environmental Impact Statement or EIS. The purpose of the hearing is to receive formal comments from the public on the adequacy of the draft EIS. Comments should focus on whether logical, appropriate alternatives to the proponent's proposals were developed and whether or not impacts associated with those alternatives were properly identified and whether or not the analysis was appropriate, in other words. My name is Larry Porter. I am with the Bureau of Land Management in Grand Junction. I will be the Hearing Officer for tonight's hearing. My role will be to conduct the hearing and rule on any points of order necessary to the proceedings. The intent of the hearing is to receive comments rather than pursue other interests which some people here may have tonight; therefore, I will ask yourselves to limit yourselves to comments this evening and if you do have questions we will be happy to meet with you after this hearing to discuss those with you. At this time do we have anyone who has indicated that they would like to present oral comments for the public record?

Okay, then I would like to remind you that you can mail in your written comments to the Bureau of Land Management, 764 Horizon Drive, Grand Junction, Colorado. Address those to Mobil/Pacific Team Leader. We will receive those comments and address them in a final EIS. We will receive the comments until May 4, 1984, and then treat them appropriately when we address the final Environmental Impact Statement. I would liks, since no one else or no one has indicated that they would like to comment, I would like the record to show that this public hearing was concluded at 7:12 p.m. and I would like to thank you very much for coming this evening.

PUBLIC HEARING

MOBIL/PACIFIC OIL SHALE DRAFT ENVIRONMENTAL IMPACT STATEMENT

April 18, 1984

DeBeque, Colorado

CERTIFICATION

I do hereby certify that the foregoing is a true and correct copy of the minutes of a Public Hearing on the Mobil/Pacific Oil Shale Draft Environmental Impact Statement on April 18, 1984, in DeBeque, Colorado.

Dorothy Coakley
Dorothy Coakley

LARRY PORTER: I would like the record to show that at 7:08 p.m. on April 18, 1984, in DeBeque, Colorado, a public hearing commenced on the Mobil/Pacific Oil Shale Draft Environmental Impact Statement or EIS, as we refer to them. The purpose of this hearing is to receive comments from the public on the adequacy of the draft EIS. Comments should focus on whether logical, appropriate alternatives to the performance proposals were developed and whether or not associated impacts with those alternatives were properly identified and the impacts identified were then adequately analyzed. My name is Larry Porter. I am with the BLM in Grand Junction and I will be the Hearing Officer for tonight's hearing. My role will be to conduct the hearing and rule on any points of order necessary to the proceedings. By way of background, I think it would be helpful to point out a few of the events that have taken place in the past that bring us to the hearing tonight. Information meetings were held around the information meetings back in the fall of 1982. Mobil and the Pacific partners put on these meetings in several locations in western Colorado and also such a meeting was held in Denver. The Bureau of Land Management then conducted a round of public scoping meetings early in 1983 and these meetings helped the BLM identify the issues that should be addressed in the Environmental Impact Statement. Those issues that the general public, other agencies, local and state governments, along with the BLM thought were important were then evaluated, put in a disclosure type format which we called an Environmental Impact Statement, and we have analyzed what we judged to be the impacts of the various alternatives that were identified along with the proponent's proposals for development of oil shale projects. We have put these out in draft form and to us the draft is a very important document, because it does give us a chance to have the public look at it and make sure that we have done the right kind of job in disclosing the impacts and analyzing those impacts to the best extent possible. The Environmental Impact Statement was released the first week in March, 1984, and comments on the draft Environmental Impact Statement will be received by BLM until May 4, 1984. We did prepare this EIS in cooperation with several other federal agencies which have either permitting or licensing action associated with the projects in question, and it is deemed to be believed to be a more efficient way to approach the environmental work if all of the agencies involved can cooperate with one lead agency designated to do the Environmental Impact Statement. That lead agency, in this case, was the Bureau of Land Management. I thought I might just mention the agencies that are looking at this document as satisfying their requirements for environmental analysis also. The six cooperating agencies along with BLM in this EIS are: the Environmental Protection Agency, U. S. Fish and Wildlife Service, Department of Energy, Naval Oil Shale Reserve, National Park Service, U. S. Forest Service and the U. S. Army Corp of Engineers. Of course, as I mentioned, the intent of this hearing is to receive comments rather than

pursuing discussions of other areas of interest which some of you may have tonight, so for that reason, I will ask those of you who do respond to limit yourself to comments of the adequacy of the Environmental Impact Staement and if you do have any questions which directly relate to your comments or relate to other topics of interest that you would like to discuss, we'll be happy to meet with you after the hearing and get into those areas of concern.

Dorothy Coakley, seated to my right, is the court reporter and will make an official transcript of the proceedings of the hearing. If any of you desire a copy of this transcript you should make arrrangements with her after the meeting. I have received an indication that we have one speaker tonight who would like to present formal comments and, Bill Prather, if you would like to come up and use the podium it would be helpful; it is a little easier to hear that way and also we make sure that we get an accurate or a good recording of your comments for the reporter. After Bill is finished, I will address the question of whether or not anyone else who may come in while Bill is speaking would like to give comment also. I would also like those who give comments, for the benefit of the reporter, to state your name, your address and who you are representing, if you are representing yourself or a particular organization that would be helpful. Okay, Bill.

BILL PRATHER: I'm Bill Prather, a resident of DeBeque,

representing primarily myself, but I am on the committee of
the Cattlemen's Association. There is a lapover there that I
am not completely clear on. My comments will be somewhat in
general, on the thing, more than specific. I would like to
make one comment, that is an awful big book for someone to
read and make intelligent comments on in their spare time in
a month; therefore I am sure these will be somewhat
disjointed; but, is just one of the things that has to
happen, I guess. One of the primary problems I have is, you
named the various agencies who were participants in this, and
that is probably the problem. These agencies are specialized
in their specialties, they come and get everything to suit
their specialties and no one sees what it does to the total
overall picture; and since the local residents don't have
time, we're quite often subjected to decisions that have a
real bad impact on us and there is no appeal to these. That
would be my other topic tonight, I think it is extremely
important that the resident landowner and citizens be
191 provided a method to appeal these decisions by the government
agencies. I had some real bad experiences where the local
work people work with us and we think we have things fixed
and it goes to Denver or Washington; someone in an office
over there makes changes who has never been in the area,
didn't have time to read all the extenuatng circumstances and
then it just invariably comes home and causes a lot of
problems. So we really need some method where we are
impacted. I'll give you a couple examples. One was the gas

line went through. Now you will be having corridors for gas
and electricity and things. You contracted that out to a
contractor. He then subcontracted it. If you want to go up
there and look at my fields and I have some pictures before I
leveled them. They left a ditch over waist deep crosswise to
the corigates through my fields. The subcontractor packed
his gear and left. Some of the ditches they finally filled;
got another man. I filled some of them and some of them are
still there five years later. Another gas line company went
192 out through some ground west of town. They didn't ask me,
say good morning, how are you or anything else. They went
out there and buried a pipeline across my land and then
proceeded to haul our river gravel and pile it on my land
because they had to have chains to go from there out. They
hauled it with one truck without chains on and dumped it on
my land. Nobody ever said anything. They just took over and
I don't believe that is proper respect for the local
landowner, and there are other examples but that is probably
sufficient. This wildlife litigation, it's nearly every
place in here in numerous places, you refer to the wildlife.
They seem to be the primary concern. I don't believe there
should be any attempt to mitigate wildlife habitat after that
lose when that loss occurs on private property. The wildlife
are on that property because we have been good citizens and
let them use our land. Several years ago the Wildlife
Department came to the people and went all around with a
program to encourage landowners to improve their habitat and
I will agree I participated and was all for it. Sucker that

I was.

It is good for the economy. It is good for the environment; but what happens is, because we have wildlife habitat on our land, now they come in and penalize us as landowners because we let the wildlife use our land. In my case they confiscated a lot of it. To be exact, they needed two acres for a road and they confiscated fifty to replace the habitat on the two that I was foolish enough to leave on there in the first place.

193 Now this isn't the proper way to get along with local people. This was done by government agencies meeting without contacting me on my land holding secret meetings about what they were going to do with my land. Surely that should be in this statement somewhere that this won't take place. When they are coming in and concerned about the wildlife, you're going to move them off the Pacific land; because you do that, I don't want them over on my land. I've got more there than I want now and some way we have to accept a certain amount of wildlife habitat loss for other programs. They can't mitigate it all. This should be real important, I think. Otherwise you are going to push the landowners into a position that we have to destroy that habitat. That would be something that I don't want to do and most people don't want. It's real bad for the country but when it comes down to either you lose your property or you get rid of the habitat, you have to make a tough decision and if it comes to the latter decision, it will be real bad for everybody concerned.

I don't believe there should be any consideration of mitigation of wildlife habitat even on federal lands, where it is an introduced species in recent years and where the numbers have been increased fifty fold. This was not to build up great big numbers and then want to maintain them. I don't believe it is the proper way.

Another item that causes me a great deal of concern is the raising of funds through taxes, the sales tax method. This is very, very bad for agriculture. If I go down there and buy a tractor to do my farming, I pay a five percent or more sales tax. Well, that isn't too bad for people who buy a few consumer goods or a business who can add on when they sell something, but in agriculture it is devastating. That is taking five percent right out of my pocket and the pricing system being what it is there anyway.

So I think any special districts or any taxes, there should be an exclusion for agriculture, on major items especially, otherwise agriculture is going to have to get out of here. I think your special districts are another thing we really need to look at. We finally got them to agree to exclude agriculture from the recreation districts, thank God, but I pay taxes on my grazing land on two irrigation districts, a hospital, a college, a school, and they don't get any good out of them. It is ridiculous for this grazing land out here to have to pay taxes on an irrigation district.

I am sure sooner or later in an effort to raise water in

Colorado they are going to begin to look for some sources. Now, in the early stages, I would sure appreciate it if it was put in there that this would be given consideration. That agriculture should not have to foot the bill. Why should I, who has a ranch with a good water right, have to foot the bills for storage projects for an oil company, in a special district. At first it wasn't bad, it started out at a half a mill, it won't ever be over two; and somewhere along the line they forgot those early agreements. Maybe that's what happens when you stay in an area too long; you remember too many things. The Rifle Hospital is a perfect case and until recently I paid taxes on my livestock and machinery. Thank God we did get them off now.

I say again that whenever your agencies meet to discuss some of these problems, you named the wildlife, local governments and three or four of the other there, I sure think they ought to at least invite agriculture people to sit in on those decision meetings, not just meet and make plans that affect us so greatly without meeting with us. Maybe we won't have time to come, but it sure is important, and any action which you take because of the growth in the area which is going to take away from our private property rights, that ought to be done through negotiation rather than mandates.

We get a lot of this stuff that just comes down as a government mandate somewhere, it's getting to be a terrible burden on us.

As I say, there are some other comments that I haven't figured out how to phrase them, so they make even as much sense as the ones I have given but perhaps I'll have a little time and there are two or three others in there on some other things, if I have a chance I will submit them later.

LARRY PORTER: Bill, we do appreciate your comments, and I have to apologize to you and the other people present, I failed to introduce Mr. Philip Neal, seated directly to my left, who is the team leader for BLM on this Environmental Impact Statement, and Mr. Ray Porter with Dames and Moore Consultants, who assisted BLM in preparing the EIS, and these gentlemen are going to be responsible for addressing any comments that are made; and occasionally they do have questions which will help them better respond to your comments, not in interrogation or anything, but if there is something that would help them better respond they would like to clarify that. I would like to ask Phil and Ray if they have any questions for Mr. Prather at this time that would assist you.

PHIL NEAL: I do have one. Mr. Prather, you had talked of the change from land from agriculture use to recreation use or a recreation district.

BILL PRATHER: No, I was speaking of the special districts for taxes, and we were able to form two recreation districts and I am sure they will form another one down here if you folks start, they left it open to and I would not want agriculture land to have to pay this special district tax.

PHIL NEAL: Who is doing that, Mr. Prather?

BILL PRATHER: The county and the residents within the area. They now have one in the Silt-Rifle-New Castle area. Parachute and them never could quite get together so they have a separate recreation district. By the way, some of my grazing land would have been in the Parachute district had agriculture land not been excluded. So it means quite a lot to us.

PHIL NEAL: Is that a part of the land use plan change?

BILL PRATHER: Not the special district. This is just a special district formed to put together some recreation for all these people who are going to be in here and need them. But it is a land use in a sense because it is financially impact.

PHIL NEAL: Thank you very much.

LARRY PORTER: Ray, did you have any questions?

RAY PORTER: No, I don't think so.

LARRY PORTER: Thank you very much, Bill, for your comments.

BILL PRATHER: We appreciate you folks taking time to come this time and earlier on, too. It shows you are working in the right direction, anyway. I just wish we could do our job a little bit better, maybe, but if you could find some way when we have a complaint so we don't have to go through court or something like that. If there would just be someone we could call up and say "Hey, these guys aren't doing us right," and somebody get hold of them. So far we haven't been able to do that. It is creating a lot of hostility. It

used to be just inconvenience but it is becoming hostility now. I see a guy out in my field with a survey rod and I'm almost ready to get the rifle and go run him off and that's not good.

LARRY PORTER: Thank you, Bill. I would like to remind all of you that we do have an attendance roster at the table in the back of the room and we would appreciate it if you would sign that roster if you didn't sign it when you came in.

Is there anyone here who came in after we brought the speaker register up front who would like to present oral comments at this hearing at this time? I would like to remind you that your comments, either oral or written, which pertains to the adequacy of this impact assessment or to present new data to us will be addressed in the final impact statement which we will do on these two projects.

Since no one else has indicated that they would like to make oral comments this evening I would like to emphasize that we will receive written comments, so if you have time to look the document over a little more and look at the impacts that are analyzed, and if you think of some things that would be helpful to us in putting together the final analysis, we would appreciate receiving those comments. There is an address in front of the Environmental Impact Statement where you can send those. You should address them to the Mobil/Pacific EIS Team Leader. That is Mr. Phil Neal at the BLM District Office in Grand Junction. The address is 764 Horizon Drive in Grand Junction, and, since no one has indicated that they would like to present additional oral comments, I would remind you also that we will be available for other discussion after the hearing is closed. I would like the record to show that, oh, excuse me, I'm sorry, ...thanks, Phil. The date that we have to receive the comments by is May 4, 1984, and this is quite important because we are on a rather tight schedule with the work that has to proceed and on some of the other projecte we have going, so we do have to have the commente by that time if we are going to address them in the final Environmental Impact Statement, and I would like to thank you, ladies and gentlemen, for coming this evening. We appreciate the fact that you are willing to come out for these kinds of hearinge and we do see a lot of value in the information we receive from them.

I would like the record to show that thie public hearing was concluded at 7:32 p.m. and, once again, thank you very much for attending.

PUBLIC HEARING

MOBIL/PACIFIC OIL SHALE DRAFT ENVIRONMENTAL IMPACT STATEMENT

April 19, 1984

Grand Junction, Colorado

CERTIFICATION

I do hereby certify that the foregoing is a true and correct copy of the minutes of a Public Hearing on the Mobil/Pacific Oil Shale Draft Environmental Impact Statement on April 19, 1984, in Grand Junction, Colorado.

Dorothy Coakley

Dorothy Coakley

LARRY PORTER: At 7:05 p.m. on April 19, 1984, in Grand Junction, Colorado, a public hearing commenced on the Mobil/Pacific Oil Shale Draft Environmental Impact Statement or EIS as we will refer to it.

The purpose of this hearing is to receive comments from the public on the adequacy of the draft EIS. Comments should focus on whether or not logical, appropriate alternatives to the proponent's proposals were developed, whether the associated impacts is properly identified and on the adequacy of the analysis of those impacts.

My name is Larry Porter. I am with the Bureau of Land Management here in the Grand Junction office and I will be the Hearing Officer for tonight's hearing. My role will be to conduct the hearing and rule on any points of order necessary to the proceedings. By way of background, I would like to go over a couple of points that occurred in the past that brings us to a hearing at this time.

In the fall of 1982, the project proponents, Mobil and the Pacific partners, conducted a series of public information meetings. These were followed early in 1983 by a series of public scoping meetings which the BLM conducted and, as a result of the issues gathered there from the public, issues raised internally by the Bureau of Land Management and by local agencies, governments and the various federal agencies we did put together a draft EIS which addressed the issues and the draft Environmental Impact Statement was released the first week in March, 1984.

Comments on the draft EIS will be received by the BLM until May 4, 1984. Of course, the purpose of the draft is to give us an opportunity to put it out for public review and to make sure that the analysis in there is correct and stated in the best way possible. The draft EIS was prepared in cooperation with several other agencies who look to it to satisfy their permitting and licensing requirements. I thought I might just mention briefly the six agencies that are cooperators on this EIS with the Bureau of Land Management as the lead agency: The Environmental Protection Agency, U. S. Fish and Wildlife Service, the Department of Energy, Naval Oil Shale Reserve, The National Park Service, U. S. Forest Service, U.S. Army Corps of Engineers.

The intent, of course, of this hearing is to receive oral comments and rather than to pursue other areas of interest which some people here tonight might have; therefore I will ask anyone who does make comments to stick to the subject at hand, which is the draft Environmental Impact Statement, and if any of you do have questions which you would like to discuss with us or on the topic at hand, the Environmental Impact Statement or other topics, we would be happy to discuss those with you after the hearing. We would like to keep the hearing directed towards the Environmental Impact Statement and comments which you will have on the adequacy of this document.

Dorothy Coakley, seated to my left, is the court reporter and will make an official transcript of the

proceedings of this hearing. If any of you desire a copy of this transcript, you should make arrangements with her after the meeting.

Now, for those of you who intend to present testimony this evening, thanks, Bob. I have one individual who has indicated that she would like to present oral testimony at the hearing. I would like anyone who does present testimony, and I ask the question later before we close the meeting, if there is anyone who has come in since we began the meeting, I'll ask the question if there are any others present who would like to present testimony, but I will ask those who are presenting testimony to come up to the front to the podium, if they would, and speak to the group up front. This will allow Dorothy to make an accurate copy of the comments. Also, I want to make sure that those of us at the front table can hear them properly.

I would like to introduce at this time Mr. Phil Neal, seated directly to my right. Phil is the Team Leader for the Bureau of Land Management on this Environmental Impact Statement. Next to him is seated Ray Porter with the consulting firm of Dames and Moore. Dames and Moore is the consultant that assisted the BLM in preparing this Environmental Impact Statement. And I will ask Phil and Ray to assist me as needed in clarifying any comments which individuals might have tonight, since we do have the requirement to respond to those comments on the draft Environmental Impact Statement, and it's important since these gentlemen will be heading up that response effort, that we do understand your comment.

I would like to also have Phil at this time just present a brief description of what has been analyzed in the draft EIS, after which we will proceed with the comments.

PHIL NEAL: This EIS has been prepared for two separate private oil shale developments at the southern edge of the Piceance Creek Basin in Garfield County, Colorado. The two projects are: Mobil Oil Corporation's proposed Parachute Shale Oil Project and the Pacific Shale Project proposed by joint venture of Sohio Shale Oil Company, Superior Oil Company and Cliffs Oil Shale Corporation. Mobil Oil Corporation has proposed to develop a 100,000 barrel per calendar day shale oil project north of the town of Parachute. It would involve underground mining, on-site surface, retorting and upgrading, surface disposal of processed shale and delivery of shale oil to a regional pipeline system. Pacific Shale Project proposes to develop a 100,000 barrel per stream day shale oil project on a site about ten miles northwest of the town of DeBeque. The project would involve underground mining, on-site surface retorting, upgrading, surface disposal of retorted shale on site and transfer of shale oil to a regional multi-project pipeline system. This EIS has been prepared, pursuant to request for Mobil and Pacific for rights-of-way sales and leases of public land. They have also requested approximately rights-of-way for 632 acres of public land. Mobil has requested approximately 216 acres of rights-of-way affecting the Naval Oil Shale Reserve managed by the

Department of Energy. Pacific has requested the sale of 1,397 acres of public land.

This EIS will also be used by the Army Corps of Engineers, for their 404 Permit. This EIS analyzes the potential impacts of these projects and their reasonable alternatives.

LARRY PORTER: Thanks, Phil. At this time I would like to proceed with the comments. We have one individual, Connie Albrecht, who has indicated that she would like to present a comment and is representing Friends of the Earth. Connie, for the record for Dorothy, would you give her your address, please?

CONNIE ALBRECHT: We are located in Palisade. The mailing address is P. O. Box 728, Palisade, 81526.

LARRY PORTER: Thank you.

CONNIE ALBRECHT: Maybe you guys can change all your EIS's at this time to there, because I am still getting things at my old address.

194 I certainly did not intend to be your star speaker tonight, so I will try to do the best job I can. This is one of the easier EIS's that I have had to read because there really wasn't much substance in it. It also was very difficult to read because it kept falling apart as I was reading it; the binding was so poorly done. So I am not sure I hit every page in here, but I did review fairly thoroughly the Mobil section and most of my comments apply to Mobil and to some degree to Pacific, except in specific instances where

194 I mention the reservoir site, which of course, is the Mobil proposed reservoir. And I also looked at the cumulative section as well.

The purpose and needs section, I was sort of astonished, because there wasn't any intent to justify the need for either of these projects. Especially I was surprised that there wasn't any justification for use of the fairly large amount of public lands that the projects are interested in obtaining through one means or another. The next section, the regional setting was very poorly done. It was not comprehensive. It was very inconsistent because it flip flops from quite specific detail; for example, on water issues, it flip flops from broad statements about the middle of Piceance Basin, which is not where the Mobil/Pacific projects are located, to quite specific details on projects. So I think that entire section needs to be thoroughly re-engineered.

The project section, the proposed action and alternatives, one of the things that was quite apparent from reading this EIS which we already had some clue of, was that both of these projects are extremely speculative and I would say particularly the Mobil project, because there really is not a very good choice of technology when you are talking about using several technologists on one site, none of which have really been tested on any type of commercial scale. The obvious interest to here is in getting an EIS finished only to get certain permits for a reservoir and for public lands. So we quite disagree with this being an EIS process at all at this time. It is very premature, except if you want to do an

194 EIS just for the reservoir. Consequently, the proposed action and the alternatives are very poorly laid out; in fact, most of the major alternatives aren't even considerd, they're deleted with very little explanation.

Except for one sort of interesting sentence, that says, there is a file explaining the eliminated alternatives which is down at the BLM office. It's not exactly what we use EIS's for. The few remaining alternatives are described in one sentence as to whether or not they're "reasonable" whatever that is supposed to mean. Obviously, this does not meet the needs or requirements as far as the development alternatives and the no action alternative; for example, merited one or two sentences and the preferred alternative is delayed to the final EIS, which is really not very typical either.

So, all in all, the development of alternatives was zilch and needs to be gone back over.

The maps and the charts were very scanty; they were very poorly done. I couldn't, you know, I really couldn't understand some of the maps at all. They were so poor as far as the section lines or anything.

The entire EIS looks and reads like an EIS that was done for the minimum amount of time and expense, even though a great deal of the public lands would be affected by these projects. These lands are not separated out in terms of defining the resources on those lands or the impact on those lands as far as the shale projects are concerned.

A major problem which underlies this deficient EIS is

194 that there is nothing very substantive as far as the characterization of the shale on the sites and this is quite important as far as determining specific impacts of the shale projects since the constituents in the shale on that site can be so variable from other types of shale, and because the different technologies also produce different types of spent shale. Therefore, reclamation problems - again there is the characterization that needs to be done and I think it pretty obvious that both companies do not want to take the time to commission the studies to do the characterization of shale so we could really determine the types of pollution impacts we are talking about; for example, Rio Blanco Oil Shale did not do full characterization of their shale and some of the runs that they did up into CA Tract, apparently they ran into something like seventeen times more sulphur dioxide than what they had anticipated. If you do some characterization you have a better notion of what type of problems you may run into.

This EIS suffers greatly from that type of gap in knowledge; and therefore, I think that it has to go back and do the characterization and from there it has to be an adequate analysis of pollution issues, particularly air pollution and spent shale disposal.

The water sections, both surface and ground water, aren't a great deal better, and I suggest that there needs to be a great deal more in the way of ground water monitoring on the sites to determine what sort of impacts there would be on

194 ground water and surface water. If that has been done it is not indicated in the EIS very well.

We suggest that both companies return and do their homework, do the things that are necessary to really predict the impacts before they attempt to do any more with this EIS.

Quoting other studies from other companies doesn't cut it because the site characteristics can be quite different as can be the shale.

In your affected environment section, overall this section suffers the same deficiencies that I have just pointed out, so I won't repeat everything. However, as you may note, the reservoir is located over a fault. This is the Mobil proposed reservoir, and perhaps there should be more information regarding the consequences of fault movement and/or dam failure.

The wildlife and plant life impacts also are not portrayed very well. Naming the species but not getting any numbers ranges or impacts is not sufficient in terms of description of the environmental problems.

Regarding air pollution, and acid rain in particular, we suggest that you do a more thorough literature search, because I think there is some very selective in terms of studies that were cited, and also, I am sure you know Chevron and some of the other models that were done are showing more and more possibilities as far as visibility and perhaps even acid precipitation potential. So I was a little surprised

194 ing that these two projects are of similar size and in the same area and they don't show any problems.

The entire section devoted to the affected environment needs some overhauling in order to delineate the location and the level of the various impacts and also the short term versus the long term consequences. In most cases they were just passed off, as there may be some consequences but we don't know. That really has to be set out.

Regarding the environmental comparison of alternatives, which was something of a separate section in there, it wasn't clear to me who were these "principal" investigators who followed the Delfite method and there was just no explanation as to the placement of that section or what it was supposed to be doing in relationship to the rest of the EIS.

As I mentioned before, all the criticisms more or less apply to both projects, although I did find the Pacific section even more scanty in some ways than the Mobil section.

The cumulative impact section towards the end really isn't more than an outline and I have no comment on it other than that the draft EIS will have to be overhauled to contain real analysis of cumulative impacts.

Much as I get tired of reviewing these EISs, I suggest that this draft EIS is so deficient that it needs to be redone and another draft EIS published. It doesn't even have the data that I've seen in preliminary draft EISs or environmental reports and it contains no meaningful analysis,

194 which it doesn't. Therefore, it cannot be rectified by simply responding to public comments by code numbers in a final EIS document. I urge the BLM and Mobil and Pacific to start over and commission the necessary studies to evaluate alternatives and publish a new draft EIS. Thank you.

LARRY PORTER: Connie, would you wait just a second, please? Phil and Ray, did you have any clarifying questions of Connie that might assist you?

PHIL NEAL: I have one question, please. Connie, you referenced a couple of things that, like the fault underneath the reservoir, do you plan on adding written comments later to the EIS?

194 CONNIE ALBRECHT: We probably will, you know. I don't really see the point in giving detailed comments because the whole thing needs such drastic overhauling and I could give you, you know, twenty pages of specific problems, but the whole thing needs to be done over, so I don't know that we will do extensive comments but we probably will do maybe a written summary of some of the questions we have raised tonight.

RAY PORTER: I'd like to just comment that you have made a lot of generic statements that would be difficult for us to respond to without the details, and so I think we would appreciate as much detail as possible, in your written comments.

CONNIE ALBRECHT: Well, do you want to pay me as a consultant to go through it page by page?

RAY PORTER: I assume you have details in your mind to substantiate the statements you've made and that's what we need to know. It's a matter of communication.

194 CONNIE ALBRECHT: Well, for example, I think some of this is detailed enough, you know, when you deal with the alternatives in the section that - you have the charts, you know where you have the alternatives and then you have where they are deleted. Where in the column where it says reason for eliminating, in a lot of cases those are left blank. There's no reasons giving for deleting a number of the alternatives or if there are, they are very, very sketchy. And in the narrative when you get into alternatives, like I said in my statement, simply says this alternative appears reasonable. That word is used over and over again; however, there is no backup fact. Okay. I mean, there is just a very little factual backup through most of the EIS and you know, it would take me a long time to go through it sentence by sentence, you know, to do that, but I think I have given you some indication, I hope, that are some of the major problems.

LARRY PORTER: Yes, thank you very much, Connie.

Are there any other individuals who would like to present oral comments here this evening?

I would like to mention that we will receive the written comments here in the BLM District Office until May 4, 1984, and those should be addressed to the Mobil/Pacific EIS Team Leader, BLM District Office, 764 Horizon Drive, Grand Junction, Colorado, and we would appreciate receiving them.

In fact, as soon as possible, if somebody has some they would like to send in sooner than May 4. That would be helpful.

Since no one else has indicated that they would like to comment, I would like the record to show that this public hearing was concluded at 7:27 p.m., and I would like to thank you all very much for attending.

APPENDIX B

RESPONSES TO COMMENTS

Appendix B

RESPONSES TO COMMENTS

Response to Comment No. 1

Please refer to Section 3.3.5.1, page 3-174.

Response to Comment No. 2

Please refer to revised Figure 2.13-1, page 2-25.

Response to Comment No. 3

The most recent data available at the time that the analysis was conducted were used in this EIS. The use of revised population figures would not affect the relative magnitude of the population impacts.

Response to Comment No. 4

The jurisdictions were selected through discussions with local planning officials and are those that were thought to be impacted significantly. More jurisdictions would have required a great deal of speculation and assumptions, and would have resulted in detail beyond the scope of this EIS.

Response to Comment No. 5

Standardization of the facility capacities is not necessarily desirable. Different systems may have different constraints that limit capacity. The standards used for each jurisdiction represent the standards that were deemed applicable for each system.

Response to Comment No. 6

Please see response to Comment No. 4.

Response to Comment No. 7

The recent division of the Joint City/County Development Department is noted and reflected in revision of the second paragraph on page 2-52. There is no mention of the City Development Department as the third paragraph on page 2-52 does not list the various departments of city government.

Response to Comment No. 8

Figures in Table 2.14-13 on page 2-55 have been revised to be consistent with those on page 2-35.

Response to Comment No. 9

The debt and debt service figures were taken from the Draft EIS for the Clear Creek Shale Oil Project. Later analysis conducted by BMML revised the figures as indicated in the Chevron Shale Oil Company Clear Creek Project Socioeconomic Assessment Appendix, Volume II, January 3, 1984, page A-7-116. The debt service costs were incorporated in the fiscal analysis conducted for the Mobil-Pacific EIS.

Response to Comment No. 10

The third paragraph of Section 2.14.6.4 (page 2-58) has been revised to clarify allocation of sales tax. The model and data bases are adequately specified.

Response to Comment No. 11

The allocations of work forces, both construction and operation, were developed through discussions with local (County and City) planning officials and representatives of Mobil. The actual residential allocation of work force for the project will depend upon conditions in the local areas at the time that construction is initiated.

Mitigation of impacts will be defined at the time of permitting.

Response to Comment No. 12

Please see response to Comment No. 4.

Response to Comment No. 13

The peak impact of personnel transportation on I-70, although at a level of 450 cars per hour, is not deemed significant given the rated capacity and current traffic volumes on the interstate. However, the recommended mitigation measures have been included as uncommitted mitigation in Section 3.3.6.15 (Mobil) and Section 4.3.8.15 (Pacific).

Response to Comment No. 14

Commitments to socioeconomic mitigation measures will be made during the county permitting process. Please refer to Sections 3.3.6 and 4.3.8 for discussions of potential but uncommitted mitigation measures.

Response to Comment No. 15

The impact analysis in Chapter 4 deals only with the Pacific Project, not with the cumulative impacts of several projects.

If more than one project proposes to use a corridor, the BLM will have to judge if significant changes in impacts will occur. If the impacts are not expected to be significant, an Environmental Assessment (EA) will be written to grant the right-of-way. If significant changes are predicted, an Environmental Impact Statement (EIS) or a Supplement to an existing EIS will have to be completed. See also response to Comment No. 40.

Response to Comment No. 16

The residential allocation of work forces for the Pacific Project was developed based on monitoring of Union Oil's Phase I operations work force and in consultation with local (County and City) planning officials. Pacific plans to influence the allocation of its work force by the mechanisms described on pages 4-178 through 4-180. Commitments to mitigation will be made at the time of permitting.

Response to Comment No. 17

The work force allocation assumptions and potentially affected jurisdictions were developed through meetings and discussions with local planning officals, and are reasonable based on assumptions used in previous studies.

The figures in Table 4.3-16 are based in part on information from CITF.

Response to Comment No. 18

"Purpose and need," as used here, refers to the purpose and need for the EIS. The need stems from the request by Mobil and Pacific for varying acreages of rights-of-way, sales, or exchanges for public lands. These are explained in detail in Chapter 1.

It is not the intent of an EIS to justify the need for proposed projects but, rather, to assess the potential environmental impacts of such projects.

Response to Comment No. 19

Please note revisions in EIS.

The term Piceance Basin, as used in this EIS, refers to the geological structural basin. The Mobil and Pacific projects are located on the edge of this structural basin.

The term Piceance Creek Basin refers to the drainage basin for Piceance Creek and represents only a portion of the structural basin.

Response to Comment No. 20

The criteria for selection of alternatives in an EIS are explained in the publication "Guidance Regarding NEPA Regulations," Federal Register, Volume 48, Number 146, Thursday, July 28, 1983. On page 34267 the Council On Environmental Quality (CEQ) states "NEPA has never been interpreted to require examination of purely conjectured possibilities whose implementation is deemed remote and speculative." Rather, the agency's duty is to consider "alternatives as they exist and are likely to exist."

Title 40 Code of Federal Regulations § 1502.14 requires rigorous exploration and objective evaluation of "all reasonable alternatives." Please refer to the Glossary of Terms (Chapter 8) for the definition of "reasonable."

The information contained in this EIS is only a synthesis of data available. Voluminous additional information is available for public use in the BLM's Grand Junction District Office.

Response to Comment No. 21

Please see responses to Comment Nos. 139, 153, 166, 176, 177, and 178.

Air quality impacts are discussed in detail in the Air Quality Technical Report (Dames & Moore, 1984). Surface and ground water hydrology data for both projects are contained in baseline reports on file in the BLM Grand Junction District Office.

Response to Comment No. 22

Mobil and its contractors have reviewed the location, orientation and probability of movement regarding the Graveyard Fault on three separate occasions. This fault is not considered a capable fault (active) according to the Colorado Geological Survey (R.M. Kirkham and W.P. Rogers, 1981, Earthquake Potential in Colorado, Colorado Geological Survey Bulletin 43, Denver, Colorado). The last movement on this fault is estimated at 0.8 to 1.0 million years ago. The nearest active faults to the dam site are near Glenwood Springs (15 miles distance) but are not considered capable of producing damaging earthquakes (Kirkham and Rogers, op cit.). The closest fault identified by the Colorado Geological Survey as capable of producing damaging earthquakes is in the Dotsero-Gypsum area, 30 miles east of the dam site. The design of the dam incorporates a seismic stability equivalent to withstanding a Richter 6.5 magnitude earthquake at 30 miles distance or a Richter 5.5 earthquake at 15 miles distance. This design represents the best engineering judgment at this time. As final design engineering is conducted, a review of seismic criteria will again be undertaken and incorporated into the design.

A general discussion of the consequences of potential dam failure is provided on FEIS page 3-109. A more detailed evaluation will be conducted under a dam failure analysis study as required by the Colorado State Engineer's Office. This analysis is required to be conducted prior to submission of an application for design approval and a construction permit. An analysis of such detail is currently premature considering the preliminary engineering design stage of the project.

Response to Comment No. 23

The information contained in this EIS is only a synthesis of data available. Additional information on the Mobil Project is contained in Mobil's Parachute Shale Oil Project baseline Volumes 1-12 and supplements. Similarly, additional information on the Pacific Project is contained in 23 volumes plus supplements. Detailed information on methodology and results from air quality impact assessments is contained in the Air Quality Technical Report (Dames & Moore, 1984). Supplemental information on shale composition has been incorporated into this FEIS. All of this information is available for public use in the BLM's Grand Junction District Office.

Impacts are analyzed in Chapters 3, 4, and 5.

Response to Comment No. 24

Please refer to Glossary of Terms (Chapter 8) for definitions of the terms "Principal Investigator" and "Delphi" method. Chapter 7 lists, by discipline, Principal Investigators who participated in preparation of this EIS.

Response to Comment No. 25

Please see revised Figure 1.2-1 on page 1-5 and new Section 1.2.1.4 on page 1-8.

Response to Comment No. 26

Please see response to Comment No. 25.

Response to Comment No. 27

Comments are noted; corrections have been made in figure and text.

Response to Comment No. 28

The text has been corrected. This change does not affect other data elements since the data bases and models are correctly specified.

Response to Comment No. 29

The volume of water Mobil may be able to purchase from Ruedi Reservoir is currently unknown. In view of the competitive bid procedure proposed by the U.S. Bureau of Reclamation, there is no assurance that Mobil would get any water for industrial use. The complicated bidding and contracting procedures currently advocated by the U.S. Bureau of Reclamation make it doubtful that Mobil's entire industrial supply could be acquired from this source, thus necessitating the construction of the Main Elk Reservoir regardless of the Ruedi Reservoir contract outcome.

The current plans are for utilization of Ruedi Reservoir as a supplemental source of water to augment Main Elk during periods of extreme drought or mechanical/ operational problems. Therefore, the acquisition of a Ruedi service contract would not have any bearing on the size or capacity of the Main Elk Dam and reservoir.

Response to Comment No. 30

All wastewater will be contained onsite during operation; none will be discharged to the environment. Thus, the comment is not applicable. Potential processed shale leachate effects are discussed in the response to Comment No. 139.

Response to Comment No. 31

Please refer to responses to Comment No. 47 and Comment No. 121.

Response to Comment No. 32

The need for and exact location of the Mobil man-camp is more appropriately determined during the permitting process. To site the man-camp at this time may preclude more appropriate locations in the future. Local conditions may change and influence the best location.

Response to Comment No. 33

Mobil plans to initially move all heavy equipment to the site and have it remain there during reservoir construction.

Commuting of the peak work force of 280 over the 5-year construction period should not significantly affect either traffic on, or maintenance of, County Road 245. If congestion on County Road 245 is anticipated in light of precise work schedules, impacts could be mitigated by use of minibus or van pools. Also, see response to Comment No. 135.

Response to Comment No. 34

This EIS was prepared by Dames & Moore and its subcontractors under a contract to BLM. As a member of the Cumulative Impacts Task Force (CITF), BLM has the authority to permit its contractors to use CITF materials.

Response to Comment No. 35

Please see correction of FEIS page 4-179, reflecting a construction camp accommodating up to 680 workers.

Response to Comment No. 36

Mitigation is defined as avoiding, minimizing, compensating, rectifying, reducing, or eliminating an adverse environmental impact (BLM, 1981a). The mitigation measures discussed are uncommitted actions that may be considered by Mobil and Pacific or regulatory agencies in the permitting processes. They are measures that have been used in the past for projects with similar features and could reduce the impacts discussed in Sections 3.3.1 and 4.3.1.

The BLM recognizes the permitting authority of county governments and, in particular, the very specific socioeconomic mitigation requirements of Garfield County's permitting process.

Response to Comment No. 37

Pacific concurs that the east boundary of the Pacific Project area as identified in the referenced figures is the mineral ownership boundary and not the surface ownership boundary. Pacific does not propose to locate any surface facilities on surface owned in fee by Cities. If it is determined to be necessary to locate facilities on surface owned by Cities, a mutually acceptable agreement between Pacific and Cities would be negotiated.

A portion of the Mesa Top/Head of Hollow Retorted Shale Disposal Alternative and a portion of the Conn Creek Route Mesa Top Access Road Location Alternative are located on surface owned by Cities. These two alternatives are not proposed actions for the Pacific Project, but are alternatives considered by the BLM.

Exhaust Adits 5 and 7, and the mining access entries would not be located on surface owned by Cities.

Response to Comment No. 38

Please refer to FEIS Sections 3.3.5 and 4.3.7 for committed mitigation.

Response to Comment No. 39

Please note that the USF&WS' final impact analysis was not submitted to the BLM until January 31, 1984, by which time it was too late to incorporate into the DEIS.

The Delphi process is a proven, technically and legally defensible system for comparison of impacts. In most instances, the Delphi process draws the same conclusion as the impact analysis. The difference between the systems can be attributed to professional judgment and opinions.

Response to Comment No. 40

Common pipeline, powerlines, or other other corridors are subject to stipulations in the right-of-way (ROW) lease issued by the BLM. Continued use will be dependent upon the Companies' compliance with all the requirements of the ROW lease.

Response to Comment No. 41

Comment noted.

Response to Comment No. 42

Cumulative impact analysis was divided into two areas of influence. Generally, most impacts occur within a multi-county section around each project. For such fields as socioeconomic, wildlife, vegetation, water quality, and others, BLM judged the probable impacts within the section could be followed until they became insignificant.

However, air quality is influenced or can influence events outside this area. For air quality, BLM chose an area which extends from Utah and Wyoming to the Mt. Zirkel Wilderness Area in Colorado.

Please refer to FEIS pages 5-2 and 5-3, and the Air Quality Technical Report for the Mobil-Pacific Oil Shale EIS for identification of the projects which were included in the cumulative quality impact analysis.

The BLM did not list the Cities Service Shale Oil Project or the Getty Shale Oil Project because they were not publically announced as of December 1982 which is a baseline condition for analysis in this EIS. The Gary Refinery is an existing facility so that its influence is a part of the existing air quality.

Response to Comment No. 43

Comment noted.

Response to Comment No. 44

Impacts on birds are evaluated in Chapters 3 and 4, respectively, for the Mobil and Pacific projects. The comment has been noted and is reflected in a revision of page 2-22.

Response to Comment No. 45

The comment is noted; wildlife habitat has been included on page 2-24 as a form of land use.

Response to Comment No. 46

Coke will not be produced from coal but, rather, will be a product of the upgrading process, as described below. Mobil does not propose using coal for any purpose on this project.

The raw shale oil products from the retorts will be processed in the Effluent Processing Plants. Effluent Processing Plants are designed to yield de-ashed heavy oil, distillate, and lighter products. De-ashing is the process of removing shale fines from the raw shale oil through washing with water. Hydrotreating will remove substantial amounts of impurities from the raw shale oil (i.e., nitrogen, oxygen, and sulfur compounds). Nitrogen will be removed in the form of ammonia, which will be collected and treated to produce fertilizer grade anhydrous ammonia (NH_3). Oxygen will be combined with hydrogen and removed in the form of water. Sulfur will be produced from both hydrogen sulfide (H_2S) in the retort off-gases and from hydrotreating the raw shale oil components.

The de-ashed heavy oil will be processed in the Delayed Coke Plant where the heavy oil will first be separated into 850°F- (boiling point less than 850°F) and 850°F+ (boiling point greater than 850°F) fractions. The 850°F+ fraction will be coked. Both the 850°F- fraction and the gas oil fraction (650°F to 850°F) produced from coking will be sent to the Heavy Oil Hydrotreater (HDT). The coke produced from the delayed coker will be used as fuel in the power generation facilities.

Response to Comment No. 47

Published studies show that highly compacted processed shale can achieve impervious conditions (10^{-6} cm/second). This is discussed in the September 1983 quarterly issue of Pace Synthetic Fuels Report (page 2-51, Volume 20, November 3), in the section titled "Design Rationale for Spent Shale Disposal." This information originally came from a paper, "Rationale for Design of Spent Shale Disposal Facilities: A Review," by C.V. Logie and R.L. Harlan, presented at the 1983 Summer National Meeting of AIChE on August 28, 1983 in Denver, Colorado.

The Pace Synfuels Report states, ". . . The results of the review indicate that if spent shale is adequately compacted and is emplaced in a storage pile in an unsaturated condition that the pile should maintain stability and will have a low probability of becoming saturated and producing leachates."

Mobil believes that processed shale compaction can be used as an effective sealing medium for processed shale disposal. Detailed methodologies cannot be developed until site specific studies have been accomplished. Nevertheless, the principle (and performance) of using compacted processed shale has been demonstrated.

Please refer to responses to Comment No. 121 and Comment No. 151 for responses to related comments. While Mobil believes that the controls defined will minimize any seepage or leachate effects, the response to Comment No. 139 discusses a worst case analysis of such effects.

Response to Comment No. 48

The Mobil Project design has not been progressed to the point where Mobil can definitely predict the quality of the water to be used for processed shale quenching.

As shown in the project water balance (Figure 3.1-10), a total of 4360 gpm of water is required for processed shale handling and quenching. This water is supplied from the reclaimed water system and the Colorado River. The water in the reclaimed water system is treated process and sanitary wastewater plus blowdown and regenerate streams from cooling towers, process steam and power generation operations. Table 3.1-6 defines treatment of these waters prior to reuse.

While the BLM is not aware of any data on the polynuclear aromatic hydrocarbon (PNA) content of these wastewater streams, similar streams exist in the refining industry. The EPA has done extensive testing of refinery effluents for priority pollutants and has found biological treatment (the same as that planned for Mobil's project) can reduce these pollutants to near or below detectable levels.

The term "shale quenching" is not directly applicable to the Superior Retorting Process to be used by the Pacific Project. As shown in Figure 4.1-9 of the EIS, the cooled shale exiting the retort passes through a liquid seal which contains non-oily wastewater. Sour process water is treated by steam stripping and biological oxidation to remove H_2S, NH_3, and hydrocarbons, including polynuclear aromatics.

Response to Comment No. 49

The spent catalysts that will be disposed of as hazardous waste, as classified under RCRA, generally will have an inert alumina base and they will be contaminated with carbon, iron oxide scale, and heavy metals. The actual chemical nature of spent catalysts has not been determined since the project design has not progressed to that point.

The sources and types of spent catalyst anticipated in Mobil's Project Description and Alternatives (Table 1.10-15 of that document) are:

Source	Catalyst Type
Sulfur recovery Plant	Alumina
Hydrotreating Units	
- Guard Bed	Ni-Mo, Alumina
- Reactor Bed	Ni-Mo
Hydrogen Plant	
- Feed Desulfurizer	Co-Mo
- Guard Bed	ZnO
- Reformer	Ni
- High Temp Shift Converter	FeO/CrO
Tail Gas Unit	Co-Mo

The project design has not progressed to the point where the type of leak-proof containers, storage facilities and safety precautions pertaining to hazardous waste have been fully defined; however, the project design will conform to all applicable regulations and standards regarding the handling of hazardous waste.

Response to Comment No. 50

The project design has not progressed to the point where Mobil can predict the chemical characteristics of hazardous waste produced.

The hazardous waste as classified under RCRA will include the following (Mobil Parachute Shale Oil Project Description and Alternatives, Tables 1.10-11 and 1.10-15):

- miscellaneous industrial chemicals
- waste oils and solvents
- oil or solvent contaminated rags
- API separator bottom sludge
- DAF float
- de-asher wastewater precipitate
- spent catalyst
- slop oils

Response to Comment No. 51

Comment noted.

Response to Comment No. 52

According to the Mobil Baseline Report, these other species were not observed on the Mobil property. However, since completion of the baseline studies performed in 1981 and 1982, Thalictrum heliophilum was described as a new taxon by Dr. Wilhous of Colorado State University. The U.S. Fish & Wildlife Service has conducted further inventory studies on the Mobil Project area, and has found the species to be present.

Response to Comment No. 53

Please refer to Section 1.3, The EIS Process. The potential bald eagle stick structure will be included in the BLM's on-the-ground inspection for specific information concerning potential impact to threatened or endangered species.

Response to Comment No. 54

The BLM recognizes that all vegetation is important in some manner to wildlife. It is also important in soil formation and stabilization, and in carbon fixation. However, some vegetation types are more important than others regarding the above. The separation of vegetation into important and limited importance communities considered all of the above. Only the most important communities for wildlife were included in the "important" grouping.

Response to Comment No. 55

Please refer to response to Comment No. 38.

Response to Comment No. 56

Comment noted.

Response to Comment No. 57

Traveling screens and intake velocities of less than 0.5 foot per second are incorporated into the proposed action.

Response to Comment No. 58

Please see response to Comment No. 39.

Response to Comment No. 59

The BLM concurs with this comment. Table 3.4-1 and Section 3.4.3.10 have been revised pursuant to reevaluation of the alternatives.

Response to Comment No. 60

Please see revision on page FEIS 3-200.

Response to Comment No. 61

Please see response to Comment No. 39.

Response to Comment No. 62

The spent catalysts would be alumina based granular solids. The catalysts would contain arsenic, iron, copper, lead, molybdenum, nickel, vanadium, and zinc.

The disposal facilities would be located in an area where surface runoff could be easily controlled and diverted away from the site. Hydrogeologic conditions at the site would limit the potential for any communication of contaminants to ground-water aquifers or surface-water sources. Although a precise location for the onsite hazardous waste disposal facility has not been selected, the site under consideration is on the mesa adjacent to the proposed mesa top access road. This site has the advantages of isolation from main plant areas, easily controlled and diverted surface runoff, low potential for communication of contaminants to ground water aquifers and surface water sources, and ease of security maintenance. Other sites will continue to be evaluated.

The hazardous waste disposal facilities would comply with Title 40, Code of Federal Regulations, Part 264 (40 CFR 264), Standards for Owners and Operators of Hazardous Waste Treatment, Storage and Disposal Facilities. The hazardous wastes would be stored in the tanks and containers in the plant area until there were sufficient quantities to transport to the hazardous waste disposal site. The hazardous wastes would be transported to the hazardous waste disposal facility by appropriately constructed and maintained vehicles, in compliance with applicable regulations governing the transport of hazardous materials.

At the hazardous waste disposal site, solid hazardous wastes such as spent catalysts would be disposed of in a landfill. The landfill would have a liner that would be designed to prevent migration of wastes out of the landfill.

Prior to the disposal of hazardous waste sludge, an assessment would be conducted to determine if the sludge could be disposed of in hazardous waste land treatment units. As defined by the U.S. Environmental Protection Agency (EPA, 1980a), "Hazardous waste land treatment (HWLT) is the controlled application of hazardous wastes onto or into the aerobic surface soil horizon, accompanied by continued monitoring and management, in order to alter the physical, chemical, and biological state of the waste via biological degradation and chemical reactions in the soil so as to render such waste nonhazardous." If land treatment were used, it would be designed and operated so that no restrictions would need to be placed on use of the land following closure of the hazardous waste land treatment facility.

If sludge hazardous waste could not be adequately disposed of by hazardous waste land treatment, the volume of hazardous waste could be treated and disposed in a hazardous waste surface impoundment facility. The surface impoundments would also have liners that would be designed to prevent migration of wastes out of the impoundments. Evaporation of water from the wastes would greatly reduce the volume of hazardous wastes requiring disposal and would reduce the mobility of the waste. At the end of operation of the surface impoundments, the hazardous wastes could be permanently disposed of in the impoundments or could be removed and disposed of in the hazarous waste disposal landfill (EPA, 1980b).

REFERENCES:

Environmental Protection Agency, 1980a, Hazardous Waste Land Treatment, by K.W. Brown and Associates, Incorporated.

Environmental Protection Agency, 1980b, Closure of Hazardous Waste Surface Impoundments, by A.W. Wyss, H.K. Willard, and R.M. Evans, Acurex Corporation and R.J. Schmitt, R.G. Sherman, D.H. Bruehl, and E.M. Greco, Metcalf and Eddy, Inc.

Response to Comment No. 63

Please see pages 4-116 to 4-119.

Response to Comment No. 64

Please see Getty comment letter on page A-24 of Appendix A.

Response to Comment No. 65

Please refer to response to Comment No. 38.

Response to Comment No. 66

Comment noted.

Response to Comment No. 67

Please see response to Comment No. 39. Evaluation of the GCC reservoir assumed potential development of a fishery.

Response to Comment No. 68

The intake velocity would be 2.0 feet per second; page 4-196 reflects correction.

Response to Comment No. 69

The salinity increase projected for the Pacific Project on FEIS page 4-114 is actually 1.166 mg/l; the average annual withdrawal rate is 32 cfs. The estimate of 1.6 mg/l for the Clear Creek Shale Oil Project was for a 100,000-barrel-per-stream day project and was taken from page 4-42 of the DEIS for that project. Comparable data were not located for the Colony, Union, or Colorado-Ute projects. The Getty and Cities Service shale oil projects were not publically announced at the time. Thus, salinity increases were estimated on the basis of the average rate of salinity increase for the three projects for which data were available.

If one uses 1.1 mg/l for Union, the total salinity increase could range from 5.5 to 6.0 mg/l. A range has been applied since the salt load reductions for each project vary and affect the results obtained from the model equation. The annual water withdrawal for the Pacific Project on page 5-12 was corrected to 32 cfs; 48 cfs is the peak instantaneous rate of withdrawal and was used incorrectly.

Response to Comment No. 70

This EIS has been prepared for two separate private oil shale projects. The projects were planned by different project teams using independent design, development and operating parameters. The objectives of both projects are to produce shale oil in an environmentally and economically acceptable manner. The methods used to achieve the projects' objectives are not necessarily the same. As a result of the site-specific conditions for each project and the independent design and development of the projects, there are differences in the operating parameters and environmental impacts for the two projects.

The water requirements for the Mobil and Pacific projects are within the range of those for other proposed 100,000 bpd oil shale projects. Water requirements are affected by several factors. Among these factors are the mining method, retorting and upgrading technologies, power generation, retorted shale disposal plans and site-specific conditions.

It is not the purpose of this EIS to compare projects. "The NEPA (National Environmental Policy Act) process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment" (Title 40, Code of Federal Regulations, § 1500.1).

Response to Comment No. 71

The BLM concurs with this comment since wildlife habitats can generally be assumed to support wildlife populations at or near carrying capacities. Thus, displacement of significant numbers of wildlife from one area into another would likely result in greater numbers than habitats could support and mortality of individuals.

Response to Comment No. 72

Please see Scoping Summary on pages 1-23 to 1-25. Attendance at Denver, Colorado information and scoping meetings was so low that BLM could not justify holding public hearings in Denver. Instead, BLM concentrated their efforts in areas where interest was shown by previous attendance at information and scoping meetings.

See response to Comment No. 74 regarding long range impacts.

Response to Comment No. 73

Except for the Pacific particulate concentrations, the air quality impacts evaluated for the proposed projects fall below the allowable standards and increments while assuming a worst-case scenario. Should developments in retorting technology lead to selection of an alternative retorting process in the future, air emissions could be lower. Furthermore, all projects will be subject to a BACT (Best Available Control Technology) evaluation that will require inclusion into the project design of the most effective air emission control equipment available prior to issuance of a PSD permit. Changes in retort technology used in the project are not expected to have any significant impact on reclamation, water quality and quantity used, land use, or wildlife.

The information in the Draft EIS regarding retort processes and emissions is the best available at this time. Whenever doubt exists, worst-case (conservative) assumptions are used and described as such. The information is adequate to comply with NEPA and the CEQ regulations. More specific and detailed air quality information will be required in applications for state and Federal air quality permits.

Response to Comment No. 74

The third paragraph on DEIS page 5-2 was referring to a situation which is explained more fully in Section 5.6.2 of the Air Quality Technical Report. TAPAS modeling using terrain-influenced wind streamlines indicated that wind at the project sites blowing directly toward the Flat Tops (225 degrees) is steered by terrain west and north of the Flat Tops. Because of this terrain steering effect, TAPAS showed that a wind of approximately 236 degrees was necessary to intercept the Flat Tops. That is what is shown in FEIS Figure 3.3-3. Winds more westerly than this (greater than 236 degrees) are steered south of the Flat Tops.

The TAPAS Model was not refined, but applied differently than in previous analyses because of the availability of appropriate input data. As explained on page 5-43 of the Air Quality Technical Report, previous oil shale EISs used TAPAS assuming constant wind speed and direction for up to 24 consecutive hours. The analysis for the Mobil-Pacific Oil Shale EIS used actual measured hourly wind speed and direction for a number of worst-case days. This is more realistic than assuming constant winds.

There is great uncertainty regarding the sensitivity of ecosystems to acid deposition damage. The BLM is not aware of any scientific, peer-reviewed technical studies that establish a dose/response relationship. Rudimentary sulfur deposition estimates were included in the EIS so that comparisons to assumed thresholds could be made by the reader.

No significant impacts were predicted for the Flat Tops Wilderness Area; therefore, even smaller impacts can be expected at Steamboat Springs which is more than twice the distance from the oil shale projects. Monitoring at Rifle Gap State Park, Powderhorn Ski Area, Sunlight Ski Area, Beaver Creek Ski Area, and Steamboat Springs could be required by air quality permitting agencies. Worst-case modeling was performed for Rifle, DeBeque, Parachute, and Grand Junction because of the potential for degradation from oil shale related population growth.

Response to Comment No. 75

Figure 1.0-1 has been corrected.

Response to Comment No. 76

Figures and text have been revised pursuant to comments.

Response to Comment No. 77

According to the BLM Manual 8440, Environmental Assessment, "If the contrast exceeds the requirement for the VRM class, the impact is considered significant" (underlined here for emphasis). See the third bullet on page 3-121, Determination of Impacts.

The contrast of the proposed transmission line in Hayes Gulch would result from the fact that there are currently no structures in Hayes Gulch and little surface disturbance. A comparison of Hayes Gulch as it exists with its appearance after construction of the proposed transmission line would result in a moderate level of contrast, or difference between the two conditions. Such a level of visual contrast in a VRM Class II area would exceed the management guidelines for that area. By definition, this would result in a significant visual impact.

Response to Comment No. 78

The BLM agrees. The need for and size of a single-status camp will be addressed at a later time when specific local area and market conditions are known.

Response to Comment No. 79

The projected numbers are dependent upon assumptions made at the time and computer models used.

Response to Comment No. 80

BLM has removed the statement. The BLM believes that there could be circumstances which would require mitigation on private lands and that there is authority to require it under the Fish and Wildlife Coordination Act (Public Law 732) and the Federal Land Policy and Management Act of 1976.

Response to Comment No. 81

The impact of the Mobil Project will be dependent upon the timing and magnitude of other projects in the development scenario. If another project precedes the Mobil Project, it may utilize most or all of the available local labor. This would mean that the Mobil work force would have a higher proportion of inmigrants and, thus, a higher impact than would occur if the Mobil Project had all available local labor allocated to it.

Response to Comment No. 82

After reviewing the latest information available to Pacific, the BLM agrees that the in situ retort technology is an unreasonable alternative; FEIS Table 4.1-8 and text have been revised accordingly.

Response to Comment No. 83

The BLM agrees that "significant" occurrence of recharge to or discharge from the Lower Parachute Creek Member does not occur. However, ground water does occur in fractured zones of this stratum and is evidence that, no matter how small the quantities, both recharge and discharge do occur.

The report by Weeks describes the hydrology of the Piceance Basin drained by Piceance and Yellow creeks. However, the two referenced statements on FEIS page 4-69 are also true for the Pacific Project area. These statements are: (1) the Lower Parachute Creek is not a significant water-bearing unit; and (2) where streams incise into the Roan Plateau and expose potential water-bearing units, areas for discharge are created.

Discharge, where significant, is evidenced by springs and seeps; if discharge is into colluvium, as in Deer Park Gulch, it is evidenced by abundant plant life. Where discharge is small, the effects of plant transpiration and evaporation mask the normal identifying factors. This is because evapotranspiration occurs at a rate greater than the rate of natural ground-water discharge.

Response to Comment No. 84

Comment noted. The sand and gravel used for Pacific construction purposes will be derived from the Colorado River terraces, mainly 3 miles to the south of DeBeque (see Section 4.1.1.5).

Response to Comment No. 85

If all electrical power was generated onsite, it would require use of a small portion of the product oil produced or purchase of additional oil or gas. The gas would supplement the supply of low Btu product gas that will generate an estimated 90 percent of the electrical power requirements.

Response to Comment No. 86

Factors entered into the Universal Soil Loss Equation result in prediction of a soil loss rate of 49.3 tons/acre/year for the 2:1 slope. The nearly level area topping the 676-acre retorted shale disposal site would not experience appreciable soil loss.

Compliance with the Colorado Mined Land Reclamation Act in conducting reclamation of the embankment face, and putting to practice any successful revegetation techniques that are applicable to the Pacific Project retorted shale pile will succeed in reducing erosion and promote restoration of wildlife habitat.

Revegetation techniques of coal mine materials at Cameo and near Craig, which have different physical and chemical characteristics, may not be highly applicable to plant growth media overlying retorted shale.

Pacific's revised plans to accomplish greater slope stability and to reduce soil loss involve the construction of level benches at vertical intervals of 25 feet. This reduction in slope length would effect a calculated soil loss reduction rate from 49.3 to 11.6 tons per acre per year. This reduction would be expected to be sustained with a maintenance program to assure that the benches continued to be effective by the repair of any breaks in the berms, and by the removal of deposition that would reduce the effective holding capacity of the benches.

(The insertion of the 25-foot slope length into the Universal Soil Loss Equation results in the equation being R-30, K-.37, LS-8.75, C-.12 for a predicted soil loss of 11.6 tons per acre per year.)

Response to Comment No. 87

Surface-water runoff and ground-water discharge that occur above the elevation of the top of the retorted shale pile will be diverted around the pile and, therefore, will not come in contact with the retorted shale. However, ground-water discharge will occur below the base of the pile within the Lower Parachute Creek Member, as discussed in the response to Comment No. 83.

Potential ground-water discharge beneath the pile would be intercepted by means of an underdrainage system, thus minimizing the potential for degradation of water quality.

Response to Comment No. 88

Surface-water impacts would include potential degradation of water quality because of contact with the wastes. However, gravel drains or a discharge blanket designed to intercept ground-water discharge associated with the waste disposal barrier could greatly reduce these impacts.

The reported discharge is not evidenced because of the physical nature of evapotranspiration and the fact that most of the outcrop areas are covered by colluvium or alluvium (see response to Comment No. 83).

Response to Comment No. 89

Comment noted.

Response to Comment No. 90

The statement regarding the loss of 90 percent of the known habitat for sun-loving meadowrue pertains only to the onsite habitat. The statement has been edited to read: "The retorted shale disposal site would cover approximately 90 percent of the total known habitat and total known population of sun-loving meadowrue (Thalictrum heliophilum) on the Pacific property." The species is known to occur elsewhere but its total range is still being determined.

Response to Comment No. 91

The estimate for Scott Gulch was made by the Colorado Department of Wildlife, Grand Junction Office(verbal communication, July 1, 1983). The estimate was provided upon request for preparation of this EIS.

Response to Comment No. 92

The comment is correct. Table 4.3-12 has been revised.

Response to Comment No. 93

The impact assessment is based on input data provided by Pacific at the time that the modeling was performed. Without a railroad in the vicinity of the upgrading facility, noise levels would be below OSHA standards.

Response to Comment No. 94

The statement has been deleted as an adverse impact in Section 4.3.4. It is addressed in Section 4.3.5 as an irreversible and irretrievable commitment of resources.

Response to Comment No. 95

Consideration was given to these circumstances in the impact analysis. Section 4.4.3.13 was revised to clarify this point.

Response to Comment No. 96

The comment is noted. By trapping sediments, the reservoirs may have a beneficial impact on water quality of the Colorado River.

Response to Comment No. 97

The referenced paragraph has been revised.

Response to Comment No. 98

The BLM requested that the Companies consider use of saline water. Their responses follow.

Mobil Project

The Bureau of Reclamation's proposal to collect and pipeline saline water from the Glenwood-Dotsero Springs to Mack, Colorado has been reviewed as a possible alternative source of water. The collection system and pipeline are currently in the feasibility study phase and there is no assurance that it will be built. The water available from this source would be inadequate, both in quantity and quality, for Mobil's needs. It currently appears that saline water would be uneconomic for any project use. Also, this source, if feasible, does not appear capable of replacing Main Elk as a primary water supply. However, if the project were to be constructed in an appropriate time frame, this source would be considered further for use in the Parachute Shale Oil Project to the extent practical.

Pacific Project

Water containing 14,000 mg/l TDS (116.8 pounds per 1000 gallons) is of very poor quality and, utilizing current water treatment technologies, this water cannot reasonably be used by the Pacific Shale Project for mining, retorted shale disposal, or cooling. However, as Pacific's final project plans are developed, the potential for use of this saline water will be considered.

Response to Comment No. 99

The values quoted are based on 5-year moving averages of annual salinities. Please refer to Part VI of USDI, 1983.

Response to Comment No. 100

Please see response to Comment No. 98.

Response to Comment No. 101

Please see response to Comment No. 98.

Response to Comment No. 102

Please see revised description of Retorted shale disposal in Section 4.1.1.5.

Response to Comment No. 103

The BLM cannot guarantee that safeguards will be provided in designs for all projects included in this cumulative impact assessment. Please refer to Section 3.1 and Section 4.1, respectively, for designs of the Mobil Project and Pacific Project. Also, see responses to Comment Nos. 121, 139, and 151.

Response to Comment No. 104

This response presents a summary of conclusions from "Main Elk Reservoir Temperature, Sedimentation, Water Quality, and Eutrophication Study" prepared by Simons Li & Associates. A copy of the complete report has been provided to the Corps under separate cover. Additional copies are available in the BLM Grand Junction District Office in Grand Junction.

Temperature

A qualitative analysis of the potential reservoir impact on water temperatures along Elk Creek was made. The analysis was based on existing temperature data along the Elk Creek and measured temperature profiles for existing reservoirs with similar physical characteristics.

A comparison of the characteristics of the existing reservoirs and the proposed Main Elk Reservoir was made to show similarities. The temperature profile data for the existing reservoirs were used to bracket the expected temperature profile for the proposed Main Elk Reservoir. The temperature profile was compared to existing water temperatures in the creek to determine whether releases can maintain stream temperatures for pre-project conditions through the use of the multiple outlets.

Projected temperature differences on the Colorado River near the confluence are 0°C or 0.1°C when comparing pre- and post-project conditions. This is negligible.

A temperature difference of 1 to 1.5°C for Elk Creek in the months of April, May, and August is not expected to be significant. Natural temperature variations are even greater. The actual temperature variation in the stream is greater than identified by either extreme of the bracket. This suggests that the results presented are conservative and temperature variations of 1°C and 1.5°C along Elk Creek might not occur.

Water Quality

Water quality at the proposed Main Elk Creek Reservoir is not expected to degrade. Initial increases in bicarbonate concentrations are expected as new lands become inundated during reservoir filling. This initial increase will not degrade the water beyond its pre-project suitability for domestic and aquatic use. This effect will be short term. Annual flushing of the reservoir, releases through multiple outlets, a short hydraulic residence time, and anticipated oligotrophic conditions will promote thorough mixing and prevent the development of distinct chemical stratification. Consequently, the build up of toxic concentrations of trace metals will not occur.

Following the attainment of chemical equilibrium, salinity concentrations in the proposed reservoir will remain relatively low. Releases from the reservoir will result in a 10 mg/l increase in TDS concentrations in Elk Creek at New Castle, assuming worst-case conditions. Releases from the reservoir will result in a 1 mg/l and 0.31 mg/l increase in TDS in the Colorado River at New Castle and the Imperial Dam, respectively. The EPA drinking water standard for TDS is 500 mg/l. Releases from the proposed reservoir will not degrade the quality of use.

Sedimentation

Calculations show that, on the average, approximately 4.6 acre-feet of sediment will be deposited annually in Main Elk Creek Reservoir. Essentially, clear water will be released from the reservoir because of its trap efficiency in excess of 99 percent. Downstream of the reservoir, suspended sediment concentrations in Elk Creek will be reduced for post-project conditions. The reduction varies between about 40 percent to over 70 percent depending on the month of the year. Further downstream in the Colorado River, the maximum expected change in sediment concentrations for post-project conditions just below the confluence of Elk Creek is -4.0 ppm, a 5 percent reduction from the existing condition.

The reduction in sediment supply will not initiate channel instability in terms of bed degradation or bank migration. The Main Elk Creek and Elk Creek beds below the channel are heavily armored with small boulders and cobbles. The reservoir will be trapping mainly sand and finer material which do not make up a large portion of the bed. There will be some removal of fine sediments from between the cobbled bed, but this effect will be dampened once West Elk Creek's large contribution of sediment enters Elk Creek.

Trophic Status

The projected water quality of the Main Elk Reservoir will be the result of nutrient and hydraulic loading influenced by reservoir characteristics, such as depth, surface area, volume and hydraulic retention time. It is predicted the reservoir will be very close to oligotrophic, possibly slightly mesotrophic with dimictic turnover, as in other deep cold water lakes.

The great majority of phosphorus loading to the reservoir will come from ambient stream flow. There may be an initial increase in fertility during the first year of filling due to leaching of nitrogen and phosphorus from flooded hay meadows in the valley. The extent to which this additional fertilization will affect trophic status cannot be clearly defined until data exist on the number of cattle in the basin, fertilization practices, and soil phosphorus content of the hay meadows. It is felt, however, the flooding of meadows will be of minimal impact since total phosphorus readings do not increase downstream of the hay meadows (in one sample total phosphorus decreases). If this loading were of major consequence, an expected increase in total phosphorus should occur downstream of the meadows as leaching occurs. At most, the reservoir initially could be mesotrophic, thereafter, reverting to an oligotrophic state.

Response to Comment No. 105

Comment noted. The Pacific Project concurs.

Response to Comment No. 106

The National Park Service has indicated that these comments were for "information purposes only," identifying issues for PSD permit review. See August 7, 1984 Letter from National Park Service in Appendix A, pages A-26 and A-27.

The BLM has reviewed the proposed control and/or mitigative actions to minimize atmospheric emissions and is satisfied that the proposed actions either do, or have the potential to, conform to the air permitting requirements of Best Available Control Technology (BACT) and New Source Performance Standards (NSPS). This will, of course, have to be demonstrated in detail by the applicants during the air permitting process.

For particulate emission control, Mobil has proposed that fugitive dust from raw or processed shale handling and ash from the power plant will be controlled with baghouses, cyclones, and wet scrubbers. Particulates from the TOSCO II retort will be controlled by high efficiency cyclones and wet scrubbers, which were accepted by the EPA as BACT for the Colony PSD permit. Particulate emissions from processed shale moisturizers of both the Union and Paraho retorting systems will be controlled with wet scrubbers similar to those used with the TOSCO II. Boiler flue gas particulates will be removed by a baghouse system.

Sulfur dioxide controls specified by Mobil include using low sulfur (0.1 gr H_2S/dscf) treated fuel gas and natural gas (0.0025 gr H_2S/dscf) for fired heaters and pilots. In the TOSCO II preheat system, 95 percent SO_2 reduction will be effected by physical contact of the SO_2-containing ball heater flue gas with the feed raw shale, as was accepted as BACT for Colony PSD permit. Emissions from the sulfur recovery plant will be controlled by using treated fuel plus a three-stage Claus plant, followed by a tail gas cleanup unit. Hydrogen plant SO_2 emissions will be controlled by burning low sulfur fuel gas. Emissions from coke combustion in the power plant will be controlled by a lime spray dryer flue gas desulfurization (FGD) system followed by a baghouse.

Hydrocarbon emissions will be controlled by Mobil using an incinerator on the ball heater flue gas. Hydrocarbon storage will include floating roof tanks and pressurized spheres where applicable. Fugitive hydrocarbon from valves, flanges, and pumps will be minimized by inspection and maintenance.

Mobil indicates nitrogen oxide control requirements will be met by removal of nitrogen from fuel where possible, and by use of low-NO_x burners for the steam and power generation boilers.

With regard to comparing Mobil and Pacific project emissions, it should be noted that these are two separate projects using different technologies. The SO_2 and NO_x emissions from each project are within the range of emissions proposed by other 100,000 barrel-per-day oil shale projects in western Colorado. See Table 5.1-3 of the Air Quality Technical Report (Dames & Moore, 1984) for a listing of emission rates for other 100,000 barrel-per-day projects.

The assumed annual SO_2 background concentration for Pacific was taken from the Chevron Clear Creek project monitoring data (Table 2.1-3 on page 2-6) because those data were collected near the Pacific Project area. As a practical matter, both 1 and 11 or 12 $\mu g/m^3$ are low concentrations, and both Mobil and Pacific projects were demonstrated to be well within the Ambient Air Quality Standards even when the higher background concentration was assumed.

Please see response to Comment No. 42 regarding the Cities Service and Getty shale oil projects not being included in the cumulative impact assessment.

Please see response to Comment No. 112 regarding analysis of visibility impacts under summer conditions.

Please see response to Comment No. 74 regarding potential impacts and monitoring at Rifle Gap State Park and ski areas.

Response to Comment No. 107

Please see revision of Section 5.7.

Response to Comment No. 108

The properties that Mobil has requested rights-of-way or acquisition from BLM are not a part of the Grand Hogback. The Grand Hogback is several miles to the south.

Response to Comment No. 109

The statement has been corrected.

Response to Comment No. 110

Please see response to Comment No. 25.

Response to Comment No. 111

Many significant changes have been made in the FEIS due to additional environmental analysis (see responses to other comments). Please note page 1-19 which details the complete NEPA process.

Response to Comment No. 112

The EIS Air Quality impact analyses assumed pollutant emissions under normal operating conditions would be maximum levels described in the EIS. If control equipment malfunctions occurred, the plant could emit much greater pollutant levels, resulting in commensurately higher downwind concentrations.

It is impossible to predict at what frequency malfunctioning conditions could occur, but given the state-of-the-art of modern control technology, the expressed diligence of the operators, and the consequences of strict enforcement of emission control regulations by the State, the likelihood of significant impacts because of malfunctioning control equipment is minimal.

If an "upset condition" is because of the unpredictable failure of control equipment and not because of poor maintenance, improper or careless operation, or otherwise preventable through exercise of reasonable care, it is unlikely the State would take enforcement action. However, the operator must report the "upset condition" to Colorado Air Pollution Control Division by 10:00 a.m. of the next work day, with subsequent formal written reports by the end of the reporting quarter. Chronic problems would be subject to enforcement action.

Sections 3.3.1.1 and 4.3.1.1 of the DEIS have been revised to reflect what is known about emission rates of possible hazardous or toxic pollutants.

Please refer to the response to Comment No. 106 for a discussion of the emission control technology proposed by Mobil for its project. The Pacific Project will use similar technology, as follows.

For particulate control, Pacific proposes to enclose all conveyor transfers, sampling stations, screening stations, feed bins, etc. and pass the ventilation air to baghouses limiting emissions to 0.010 gr/acf, which was determined to be BACT in the Union PSD permit application. Particulates from fixed heaters, thermal oxidizer, and auxiliary boilers will be minimized by the use of natural gas fuel. A 99.995 percent particulate removal will be achieved on the TOSCO II fines retort through the use of a venturi scrubber and cyclone as proposed in the Colony EIS, TOSCO, and Sandwash PSD permit application. Mining particulate emission reductions of 87.5 percent will be achieved by baffled settling throughout the mine and wet suppression as described in the Paraho PSD permit application. Blasting emissions will be reduced 50 percent by baffled settling. The retorted shale bin loadout will be 85 percent controlled through partial enclosure and water sprays. Wind losses and vehicle-induced losses from the retorted shale pile will be controlled 75 percent and 90 percent, respectively, by wet suppression and bottom dump trucks.

Sulfur dixoide control specified by Pacific includes 95 percent removal by flue gas desulfurization of the exhaust gas from power generation with retort offgas. The sulfur recovery unit will be designed for 99.8 percent sulfur removal. Heaters will be fired with natural gas to limit SO_2 production. The hydrogen plant reformer furnace will also use natural gas, and H_2S in the offgas will be 99.6 percent removed by amine scrubbing.

Pacific proposes to limit hydrocarbon emissions by using external floating roof tanks with primary and secondary seals for liquid storage, and by inspection and maintenance programs for pump and compressor seals, valves, flanges, etc.

For nitrogen oxide control, Pacific will use low NO_x burners for 50 percent reductions on inert gas generators, hydrogen plant reformer furnaces, hydrotreater charge heaters, and the thermal oxidizer. A 70 percent reduction of nitrogen oxide emission from the TOSCO II fines retorts will be achieved by use of ammonia injection.

Mobil and Pacific are two separate projects using different technologies. The NO_x and SO_2 emissions from these two projects are different, but within the range of emissions proposed by other 100,000 bpd oil shale projects in western Colorado. See Table 5.1-3 of the Air Quality Technical Report for a listing of emission rates from projects other than Mobil and Pacific. Also, see response to Comment No. 142.

A total of six sources, listed on page 5-1 of the FEIS and in the response to Comment No. 137, were used in cumulative impact modeling with the Complex I model. These are the sources closest to Colorado National Monument with the greatest likelihood of affecting the Monument. Cumulative impact modeling using TAPAS included a total of 17 sources, listed in Table 5.1-3, page 5-8 of the Air Quality Technical Report.

The greatest visibility impacts are expected to occur during the summer. Plume discoloration is greatest in summer because of higher O_3 concentrations that cause faster formation of NO_2. Also, the average visual range is higher in summer making any impact more apparent.

Revisions are incorporated into pages 3-96, 4-103, and 5-8 of the FEIS to clarify that the predicted concentrations of secondary pollutants in Rifle, Grand Junction, DeBeque, and Parachute (EIS Tables 3.3-4, 4.3-7, and 5.1-4) do not include the background concentrations; actual concentrations may be higher. Comparisons to NAAQS have been removed.

The prediction that maximum background TSP concentrations would normally occur under strong winds and neutral stability conditions was based upon the analyst's observational experience on other projects. Since the DEIS was written, maximum TSP concentrations on the Pacific Project area have been 45 $\mu g/m^3$ (Mid Deer Park) and 43 $\mu g/m^3$ (Mesa), both on July 15, 1983. The wind speeds on that day were 3.3 m/sec at Mid Deer Park and 6.5 m/sec at Mesa, both of which were the highest 24-hour average wind speeds observed that month. The stability (as measured by 10 m sigma theta) was neutral (Pasquill Gifford Class D) for 22 hours at Mesa but fluctuated between unstable (Class A) and neutral at Mid Deer Park. These data appear to confirm the prediction (Camp Dresser & McKee Inc., 1983, Air Quality/ Meteorology Baseline Report, Volume III, Pacific Shale Project, prepared for Sohio Shale Oil Company, Cliffs Oil Shale Corporation, and Superior Oil Company).

Predicted TSP concentrations within Box 13 are:

Case	1	2	3	4	5	6
TSP ($\mu g/m^3$)	38	42	28	33	19	13

Dorchester Coal and Gary Refining Company are existing sources and are assumed to be in background. The Getty Oil Shale and Cities Service Oil Shale projects were not announced projects at the time the Mobil-Pacific DEIS commenced.

The statement that cumulative impacts near the Pacific Project would be nearly the same as the Pacific impacts alone was based on cumulative modeling using Complex I. Cumulative box modeling was not performed because the Chevron retort will not be located in a box-like valley. The Chevron retort will be on the plateau at an elevation of 8000 feet. Flow separation occurs under stable atmospheric conditions where the wind over the plateau decouples from the drainage wind occurring in the adjacent valleys. Consequently, emissions from Chevron would most likely be transported away in the mesoscale wind over the plateau, and not be transported down-valley as a box model would simulate. Getty Oil Shale was not an announced project when this analysis was performed.

Regarding the selection of worst-case days for TAPAS modeling, it should be noted that for the very reasons stated in the comment, Complex I modeling will not select the worst-case days for TAPAS modeling. Five to ten different potential worst-case TAPAS days were screened before selecting those days modeled.

Response to Comment No. 113

Please see revision incorporated on FEIS page 5-6.

Response to Comment No. 114

Please see response to Comment No. 98.

Response to Comment No. 115

All water rights are subject to Colorado water laws. The Colorado River Compact affects water allocations; therefore, Mobil and Pacific may have to comply with revised water allocations.

Response to Comment No. 116

See responses to Comment No. 99 and Comment No. 19.

A list of potential permits is included as Table 1.2-4. It is not a NEPA responsiblity to describe the requirements of each.

Response to Comment No. 117

Current water rights for Mobil and Pacific are discussed briefly in Sections 3.1.1.5 and 4.1.1.5, respectively. Both Mobil and Pacific have sufficient water rights to meet project needs. Any waters stored in sedimentation basins, spring flows, or mine inflows will either be bypassed through or around facilities to downstream senior water right holders. Any loss of water or impairment that would occur as a result of evaporation losses and disruption or interruption of flow to downstream water users will be mitigated as necessary. It would be premature, at present, to attempt to formulate an augmentation plan as the exact location and design of sediment ponds may change and mine inflows are uncertain. It is not known whether any disruption of spring flows will occur. When, and if, data indicate that the projects will result in the impairment of downstream water users, augmentation plans will be developed.

Both projects will file for the necessary well permits and ground-water withdrawal rights, if operations encounter mine inflows and seepage. The current designs and field data cannot adequately project such requirements.

There do not appear to be any ground water users who would be impaired by operations of either project. If, during mining, ground water users are impaired by operations of either project, these water rights will be augmented according to Colorado law. No interruptions or uses of spring flows are planned, and inflows into the mines are expected to be minimal.

Response to Comment No. 118

The impact of the proposed projects on the water supply systems of the various jurisdictions was analyzed from a fiscal impact perspective. This means that if additional water supply capacity was needed, the required capacity was calculated in terms of gallons per day and then this was converted to capital expenditures. The cumulative capital expenditure impacts, summed across all types of capital expenditures, are presented in Table 3.3-18 (page 3-160) for the Mobil Project and in Table 4.3-23 (page 4-159) for the Pacific Project.

Response to Comment No. 119

See response to Comment No. 115.

Response to Comment No. 120

Three alternatives for water storage are discussed in this EIS. All three are considered to be reasonable. Please see Section 4.4.3.6 for comparison of alternatives.

Response to Comment No. 121

Control systems for Mobil's processed shale embankment include the following:

- Three- to 8-foot highly compacted base of processed shale for the bottom layer of the disposal embankment (page 3-17, Section 3.1.1.5).
- Rock drains under the compacted layer to divert springs under and downstream from the processed shale embankment (page 3-19, Section 3.1.1.5).
- Extensive diversion ditches around the processed shale to segregate nonembankment runoff around the embankment (page 3-19, Section 3.1.1.5).
- Sealed flow structures and catchment dams to contain embankment runoff and recycle/evaporate drainage (page 3-19, Section 3.1.1.5).
- Highly compacted top layer on embankment to seal processed shale prior to final soil restoration (page 27, Section 2.7.4, Mobil Project Desription and Alternatives).
- Ongoing research on processed shale compaction and leachate control before, during, and after Upper Wheeler Gulch processed shale disposal (page 3-17, Section 3.1.1.5).

Upon final restoration, the highly compacted spent shale cap combined with the revegetated topsoil will minimize surface leaching, while the low moisture and highly compacted bottom layer will do likewise to ground-water leaching. With respect to effectiveness, please see the reply to Comment No. 47 which discusses the compacted layer. The Mobil Parachute Shale Oil Project Description and Alternatives Section 1.5.3 provides further detail on the runoff control system.

Relative to the Pacific Project, see Description of retorted shale disposal, Description of retorted shale disposal pile abandonment, and Water balance modeling for the retorted shale disposal pile in Section 4.1.1.

Response to Comment No. 122

Comment noted.

Response to Comment No. 123

Please see response to Comment No. 38.

Response to Comment No. 124

The alternative disposal sites for hazardous waste from the Mobil Project are discussed on FEIS page 3-48.

The design and operation of the hazardous waste disposal site will be defined at the time of permitting as directed by appropriate state and Federal agencies.

Response to Comment No. 125

Comment noted.

Response to Comment No. 126

Temperatures in the reservoir will be stratified. In order to maintain Elk Creek temperatures below the dam at natural levels, releases from Main Elk Reservoir will be through a multi-level outlet tower. Multiple outlets will be used to mix water from different levels of the reservoir to achieve the desired outfall temperature. Also, see response to Comment No. 104.

Response to Comment No. 127

The sentence has been revised as suggested.

Response to Comment No. 128

Please see response to Comment No. 39.

Response to Comment No. 129

The statement has been stricken, as suggested.

Response to Comment No. 130

The status of Thalictrum heliophilum has been revised to Category 2, as suggested.

As part of the consultation process under the Endangered Species Act of 1973, the BLM used the species list provided by the U.S. Fish & Wildlife Service which was current at the start of this project. In addition, all rights-of-way, leases, sales, or exchanges of public lands will incorporate a field survey for threatened and endangered species, and for cultural resources.

See also revisions incorporated on FEIS page 1-19.

Response to Comment No. 131

The U.S. Fish and Wildlife Service is presently conducting formal Section 7 consultation under the Endangered Species Act with the BLM on the Mobil Project and on the Pacific Project. The Final Biological Opinions on impacts to threatened and endangered species are expected to be issued in the near future.

Please see FEIS page 1-19 which details the complete NEPA process and on-the-ground clearances for threatened and endangered plant species.

Response to Comment No. 132

The statement is intended to note that, because of the geographical distribution of the various projects, it is unlikely that a significant precipitation event will occur at all project sites at the same time. Thus, runoff from the different processed shale disposal areas is not likely to be additive, but would potentially occur sequentially into the Colorado River.

Please see Section 3.1 and Section 4.1, respectively, for description of expected leachate problems from Mobil and Pacific projects. Also, please see the responses to Comment Nos. 121, 139, and 151. The BLM cannot answer the question of how anticipated runoff and leachate will be handled at other projects included in this cumulative impact assessment.

Response to Comment No. 133

The documentation requested is too voluminous to include in the EIS.

Full documentation of the formulas and coefficients used in FISPLAN can be found in Chevron Shale Oil Company Clear Creek Project, Socioeconomic Assessment, Appendix, Volume II, prepared by BMML, Inc. dated January 3, 1983.

A copy of FISPLAN is available for review at the BLM Grand Junction District Office. Assumptions, methodology, and specific revenue and expenditure coefficients used are described in FISPLAN. Cumulative impacts are described in Chapter 5 and a copy of CITF is available for review at the BLM Grand Junction District Office.

Response to Comment No. 134

Mobil Project

The project design has not been progressed to the point where highway routes, weights, sizes, and lengths of greatly oversized loads have been defined.

Mobil anticipates a large percentage of heavy and oversized loads will be delivered to the project by railroad. These heavy loads will be transported from the railroad facilities planned on Mahaffey ranch to the construction site on the Roan Plateau via the proposed access road with minimal use of public highways.

Pacific Project

The majority of the oversized loads would be transported by rail to the DeBeque area during construction. Oversized shipments would be offloaded from the rail cars to trucks and would be trucked from DeBeque to the project site. The weights and dimensions of the loads, the number of loads, and the dates of shipment have not been determined. However, transport would be conducted in compliance with State of Colorado, Department of Highways Special Transport Permit requirements for the movement of oversize and overweight vehicles and loads.

Response to Comment No. 135

Traffic volumes on highway and county road systems will be dependent on residential locations of workers, work schedules, and mitigation measures which are implemented. They cannot be defined at this time.

Measures that could be considered to mitigate possible impacts on the transportation systems in the area include:

- upgrading and widening of bridges
- road construction and improvements
- rail crossing upgrades
- bus transportation or some other form of mass transit for workers
- shift scheduling to reduce congestion

These measures have been included in Sections 3.3.6.15 and 4.3.8.15, and could be implemented through working arrangements with the relevant jurisdiction or transportation authorities.

Response to Comment No. 136

Potential mitigation measures for socioeconomic impacts are identified in Sections 3.3.6.14 and 4.3.8.14. Specific committed mitigation will be defined during the permitting process. See also response to Comment No. 36.

See revision incorporated on FEIS page 2-53 regarding Garfield County's social services.

Response to Comment No. 137

As stated on page 5-1, the cumulative analysis included the following sources:

Project	Size
Mobil	100,000 bpd
Pacific	100,000 bpd
Union Parachute Phase II	90,000 bpd
Chevron Clear Creek	100,000 bpd
Exxon Colony	47,000 bpd
Colorado-Ute Southwest Power	500 MW

These sources were modeled together using Complex I and 18 months of meteorological data from Mobil's Roan Plateau station. These are the major sources expected to contribute to impacts at Colorado National Monument. The EIS was not intended to track increment consumption for regulatory agencies.

As noted on page 5-7 of the Air Quality Technical Report, the long range transport modeling using TAPAS did include ten other sources in addition to those named above (see AQTR Table 5.1-3). The Cities Service and Getty projects were not included because the projects were not announced at the time the DEIS was prepared. Tract C-11 was not included because it has not been leased. Magic Circle, TOSCO, and C & A Mineral are outside the modeling area considered by TAPAS and, because of their distance, are expected to have minimal contribution to cumulative impacts.

It is not necessary to perform the additional increment consumption modeling requested in the comment for the EIS. This kind of modeling is more appropriately performed when PSD permit applications are made by each project.

Response to Comment No. 138

Mobil Project

In response to the comment "consider recovery of the energy value of spent shale," on FEIS page 3-45 it states, "Mobil also wishes to consider the Chevron STB, Lurgi, and Circular Grate retorts for possible use in this project." These three alternative retort technologies include facilities for recovery of the carbon off spent shale. Furthermore, the Paraho DH retort burns the carbon off the spent shale and is one of the three retort technologies selected for the project.

As stated on page 21 of the Parachute Shale Oil Project, Description and Alternatives Volume 2, ". . . Union B, TOSCO II and Paraho DH appeared to be the closest to commercial development, and they were, therefore, preferred for the project."

Pacific Project

The Superior circular grate retorting process, which is proposed by Pacific to handle 90 percent of the raw shale feed, optimizes the recovery of energy values from the raw shale. As the shale passes through the retort, approximately 20 percent of the "residual carbon" in the shale is recovered (burned) to provide thermal energy to the recirculating gas stream which, in turn, retorts (pyrolyzes) the incoming raw shale. Further, in the retort section immediately before the retorted shale discharge from the retort, the sensible energy in the retorted shale is recovered, which lowers the shale temperature to about 200°F. Further recovery of energy values from the retorted shale is not reasonable.

The TOSCO II process, which handles the fines shale fraction or about 10 percent of the raw shale feed, recovers a portion of the retorted shale sensible energy through the generation of steam. However, the process does not presently lend itself to energy recovery from "residual carbon."

Please see Section 3.4 and Section 4.4 for environmental comparison of alternatives.

A supplemental EIS will be prepared if significant changes in impacts are expected because of any change in technology applied to the projects.

Response to Comment No. 139

Mobil Project

The project design has not been progressed to the point where Mobil can predict the quality of the wastewater streams. Mobil intends to treat wastewater streams as appropriate for removal of arsenic, oil and suspended solids, hydrogen sulfide, ammonia, and chromate. In addition, biological oxidation will be used to further treat process water where applicable prior to reuse. Tables 3.1-5 and 3.1-6 list the wastewater streams, treatment plans, dispositions and volumes in lieu of the suggested flow diagram.

Table 1 (below) is an estimate of the chemical composition of potential leachate and runoff during shale disposal and after reclamation of the disposal embankment. The basis for this estimate is the In-Situ Inc. (August 1984) report, which is available for review at the BLM Grand Junction District Office. To the extent currently possible, this estimate incorporates the effect of using wastewater in shale disposal. The constituent concentrations are considered a worst case. The In Situ report establishes that, under worst-case conditions, leachate and runoff of the Table 1 quality would not result in significant impact on the water quality of Parachute Creek or the Colorado River. The worst-case increase in chemical constituents in the rivers is shown in the following Tables 2 and 3.

Table 1. Characterization for selected chemical constituents in leachate and runoff from Mobil retorted shale disposal sites

During-Construction (short-term, 1-30 years)		
Indicator Variable	Leachate	Runoff
Dissolved Solids (DS) (mg/l)	38,000	3,000
Sulfate (SO_4) (mg/l)	29,000	2,300
Total Organic Carbon (TOC) (mg/l)	350	10
Arsenic (As) (microg/l)	99	10
Boron (B) (mg/l)	13	2.6
Fluoride (F) (mg/l)	17	8.7
Selenium (Se) (microg/l)	770	6.9
Post-Reclamation (long-term, >30 years)		
Indicator Variable		
Dissolved Solids (DS) (mg/l)	7,400	650
Sulfate (SO_4) (mg/l)	5,800	450
Total Organic Carbon (TOC) (mg/l)	61	3.9
Arsenic (As) (microg/l)	21	5.0
Boron (B) (mg/l)	2.7	0.46
Fluoride (F) (mg/l)	9.0	2.5
Selenium (Se) (microg/l)	150	1.8

Table 2. Comparison of stream standards and ambient and worst-case impacted concentrations, Parachute Creek and Colorado River in Colorado[a]

Constituent	Segement 4[a] Parachute Creek at Parachute (30.9 cfs)	Segment 2[a] Colorado River Near Cameo (3780 cfs)	Segment 3[a] Colorado River at CO-UT State Line (5740 cfs)
Dissolved solids (mg/l Standard:	(b)	(b)	(b)
Ambient Concentrations:	859	405	639
Impacted Concentrations:	1170	407	640
Sulfate (mg/l Standard):	(b)	250	(b)
Ambient Concentrations:	328	124	287
Impacted Concentrations:	565	126	288
Arsenic (mg/l) Standard:	100	50	50
Ambient Concentrations:	4	3	2
Impacted Concentrations:	5	3	2
Boron (mg/l) Standard:	0.75	0.75	0.75
Ambient Concentrations:	0.15	0.04	--[c]
Impacted Concentrations:	0.25	0.04	--[c]
Selenium (mg/l) Standard:	20	10	20
Ambient Concentrations:	3	1	8
Impacted Concentrations:	8	1	8

[a] Reference for standards: Colorado Department of Health (1982, 1983). Based upon 1 percent change for assumed annual precipitation pile chemical loads impacting on associated streamflows.

[b] No state stream standard is applicable.

[c] Ambient data are not available.

Table 3. Estimated worst case water-quality impacts in the Colorado River, combined Mobil Stage I and Stage II retorted shale disposal piles, leachate and runoff[a]

Location	TDS	SO_4	TOC	As[b]	B	F	Se[b]
Concentration at Colorado River at Cameo, CO (tpd)	4,115[c]	1,260	NA[d]	61	0.4[e]	3.0	20
Percent Change in concentration due to Project:	0.6	1.6		0.3	2.5	1.3	4.5
Concentration in Colorado River at CO-UT state line (tpd)	9,860	4,430	247	62	NA[d]	4.6	250
Percent Change in concentration due to Project:	0.3	0.4	0.1	0.3		0.9	0.4
Concentration in Colorado River at Cisco, UT (tpd)	11,020[c]	5,300	222	202	1.6[e]	6.1	121
Percent Change in concentration due to Project:	0.2	0.4	0.1	0.1	0.6	0.7	0.7
Concentration in Colorado River at Lee's Ferry, AZ (tpd)	21,140[c]	7,730	144	131	3.1	9.8	229
Percent Change in concentration due to Project:	0.1	0.3	0.1	0.2	0.3	0.4	0.4
Concentration in Colorado River above Imperial Dam, AZ (tpd)	23,520[c]	9,110	188	235	0.8	15	117
Percent Change in concentration due to Project:	0.1	0.2	0.1	0.1	1.2	0.3	0.8
Incremental Loadings due to Mobil (tpd) (100-year recurrence associated with annual precipitation leachate and runoff)	26	20	0.2	0.2	0.01	0.04	0.9

[a] Percentages and long-term pile loads are rounded.

[b] lb/d.

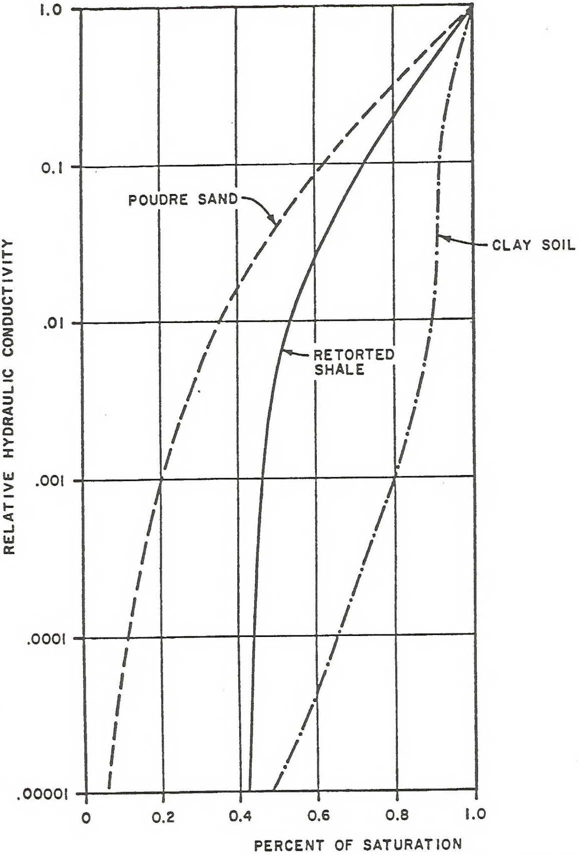
[c] Based upon discharge-weighted concentrations for more accurate estimate of loads.

[d] Stream ambient data not available at this location.

[e] Based upon historical ambient data (Iorns and others, 1965).

Inputs to the In-Situ modeling included physical parameters for the retorted shale disposal pile for each of the top six 1-foot layers including initial shale and/or soil moisture content, field capacity, permanent wilting point percentage, saturated hydraulic conductivity, and porosity (see Tables 4,5, and 6). It was assumed that the three spent shale types would be mixed homogenously in the pile. Also developed were a curve of relative hydraulic conductivity versus saturation (see following figure) and appropriate SCS runoff curve numbers (construction, 70 and reclamation, 60). Climatological-related inputs included precipitation and potential evaporation and evapotranspiration (see Tables 7, 8, 9, and 10). Table 1 shows the chemical parameters assumed for pile leachate and runoff.

Because of the status of design, these parameters had to be estimated. All values used are reasonable based on available field data. The In-Situ report describes development of the estimates.



SOURCES : UOC (1982)
DAVIS & NEUMAN (1983)

RELATIVE HYDRAULIC CONDUCTIVITY Vs. SATURATION FOR RETORTED SHALE, CLAY SOIL AND POUDRE SAND

PROJECT NO. 4130	FIG. 2

Table 4. Summary of during-construction retorted shale characteristics (Mobil Stage I and Stage II Piles)[a]

Characteristic	Retorted shale zone depth[b]					
	0-1 ft	1-2 ft	2-3 ft	3-4 ft	4-5 ft	5-6 ft
Ft						
Dry density (lb/ft^3)	85	85	85	85	85	85
Porosity (%)	46	46	46	46	46	46
Saturated hydraulic conductivity (ft/yr)	50	50	50	50	50	50
Field capacity (% by volume)	23	23	23	23	23	23
Permanent wilting point (% by volume)	11	11	11	11	11	11
Placement water content (% by volume)	19	19	19	19	19	19

[a] U.S. Bureau of Land Management (1984) and Mobil Alternative Energy, Inc. (1984).

[b] Layers of loosely placed retorted shale or "wheel-rolled" compacted retorted shale.

Table 5. Summary of post-reclamation soil and retorted shale characteristics (Mobil Stage I Pile)[a]

Characteristic	Reclamation zone depth[b]					
	0-1 ft	1-2 ft	2-3 ft	3-4 ft	4-5 ft	5-6 ft
Ft						
Dry density (lb/ft^3)	103	103	103	95	95	95
Porosity (%)	38	38	38	40	40	40
Saturated hydraulic conductivity (ft/yr)	100	100	100	50	50	50
Field capacity (% by volume)	19	19	19	20	20	20
Permanent wilting point (% by volume)	10	10	10	10	10	10
Placement water content (% by volume)	13	13	13	20	20	20

[a] U.S. Bureau of Land Management (1984) and Mobil Alternative Energy, Inc. (1984).

[b] Three-foot layers of compacted soil and compacted retorted shale.

Table 6. Summary of post-reclamation soil and retorted shale characteristics (Mobil Stage II Pile)[a]

Characteristic	Reclamation zone depth[b]					
	0-1 ft	1-2 ft	2-3 ft	3-4 ft	4-5 ft	5-6 ft
Ft						
Dry density (lb/ft^3)	89	89	89	95	95	95
Porosity (%)	46	46	46	40	40	40
Saturated hydraulic conductivity (ft/yr)	10	10	10	50	50	50
Field capacity (% by volume)	23	23	23	20	20	20
Permanent wilting point (% by volume)	11	11	11	10	10	10
Placement water content (% by volume)	16	16	16	20	20	20

[a] U.S. Bureau of Land Management (1984) and Mobil Alternative Energy, Inc. (1984).

[b] Three-foot layers of compacted soil and compacted retorted shale.

Table 7. Precipitation, evapotranspiration, and evaporation inputs to unsaturated flow model Mobil Stage I Pile (inches)

Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Precipitation[a]													
50% chance	2.29	2.32	2.29	2.59	1.99	1.82	1.88	2.76	2.57	2.24	2.01	2.84	27.60
20% chance	2.60	2.63	2.60	2.94	2.26	2.07	2.13	3.13	2.91	2.54	2.28	3.23	31.32
10% chance	2.78	2.82	2.78	3.15	2.41	2.21	2.28	3.35	3.12	2.72	2.46	3.45	33.53
5% chance	2.95	2.98	2.95	3.34	2.56	2.34	2.41	3.55	3.30	2.88	2.59	3.66	35.51
2% chance	3.15	3.19	3.15	3.57	2.73	2.51	2.58	3.80	3.53	3.07	2.77	3.91	37.96
1% chance	3.29	3.33	3.29	3.73	2.86	2.62	2.70	3.97	3.69	3.21	2.91	4.09	39.69
Evapotranspiration[b]	0	0	0	1.46	1.95	2.93	3.41	3.09	2.11	1.30	0	0	16.25
Free water surface evaporation[c]	0.75	1.32	2.09	4.16	4.75	8.88	10.00	9.55	6.82	3.36	1.68	1.03	54.39

[a] Based on average of Parachute and Marvine precipitation adjusted to Elevation 8600 feet.

[b] Bloch and Kilburn (1973); TRW (1982); Wymore (1974).

[c] Meyer equation (Meyer, 1915).

Table 8. Precipitation, evapotranspiration, and evaporation inputs to unsaturated flow model Mobil Stage II Pile (inches)

Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Precipitation[a]													
50% chance	1.81	1.83	1.81	2.05	1.57	1.44	1.48	2.18	2.03	1.77	1.60	2.26	21.83
20% chance	2.12	2.15	2.12	2.40	1.84	1.69	1.74	2.55	2.38	2.07	1.86	2.63	25.55
10% chance	2.30	2.33	2.30	2.61	2.00	1.83	1.89	2.77	2.58	2.25	2.03	2.86	27.75
5% chance	2.47	2.50	2.47	2.80	2.14	1.96	2.02	2.97	2.77	2.41	2.17	3.06	29.74
2% chance	2.67	2.70	2.67	3.03	2.32	2.12	2.19	3.22	2.99	2.61	2.35	3.32	32.19
1% chance	2.82	2.85	2.82	3.19	2.44	2.24	2.31	3.39	3.15	2.75	2.47	3.49	33.92
Evapotranspiration[b]	0	0	0	1.56	2.27	2.41	2.12	1.98	2.12	1.70	0	0	14.16
Free water surface evaporation[c]	0.81	1.51	2.63	4.48	6.36	11.21	12.06	10.88	8.19	4.16	1.81	1.05	65.16

[a] Based on average of Parachute and Marvine precipitation adjusted to Elevation 8600 feet.

[b] Bloch and Kilburn (1973); TRW (1982); Wymore (1974).

[c] Meyer equation (Meyer, 1915).

Table 9. Summary of monthly average air temperature, wind speed, and relative humidity used to estimate free water surface evaporation
Mobil Stage I Pile

Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Air temperature (°F)[a]	19.4	23.2	26.1	38.4	40.2	55.1	60.2	60.3	52.2	38.2	28.6	24.1	38.8
Wind speed (mph)[b]	5.3	6.5	8.0	9.3	9.0	9.1	8.7	8.6	8.4	7.4	6.3	5.7	7.7
Relative humidity[b]	0.69	0.57	0.45	0.38	0.33	0.29	0.32	0.35	0.37	0.44	0.56	0.66	0.45

[a] Based on correlation with Parachute for 1980, 1981, and 1982.
[b] From Grand Junction airport (17 years of data).

Table 10. Summary of monthly average air temperature, wind speed, and relative humidity used to estimate free water surface evaporation
Mobil Stage II Pile

Variable	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Air temperature (°F)[a]	2.14	26.4	31.7	40.3	47.8	61.9	65.5	64.0	57.2	43.7	30.5	24.4	42.9
Wind speed (mph)[b]	5.3	6.5	8.0	9.3	9.0	9.1	8.7	8.6	8.4	7.4	6.3	5.7	7.7
Relative humidity[b]	0.69	0.57	0.45	0.38	0.33	0.29	0.32	0.35	0.37	0.44	0.56	0.66	0.45

[a] Based on correlation with Parachute for 1980, 1981, and 1982.
[b] From Grand Junction airport (17 years of data).

Pacific Project

Please see additional information incorporated into Section 4.1.1.5 (Retorted shale disposal, Water supply and storage, Raw water treatment and use, Wastewater treatment and reuse, Retorted shale disposal pile abandonment), and responses to Comment Nos. 155, 173, 177, and 178.

Response to Comment No. 140

Mobil Project

The Corps of Engineers, a formal cooperating agency, must review this EIS and determine, in its opinion, if all NEPA requirements have been addressed to the extent that the EIS meets its 404 requirements. The BLM, as lead agency, cannot determine if all environmental concerns of the Corps have been sufficiently addressed. The BLM must rely on the Corps' responsible, independent evaluation and comments. The BLM has, however, attempted to provide all of the information referred to by the EPA.

The water quality effects of spent shale are discussed in responses to Comment Nos. 139, 148, 149, 153, and 178. The water quality effects of Main Elk Reservoir are discussed in the response to Comment No. 104. Additional discussions of water quality and aquatic ecology impacts are in Sections 3.3.1.5, 3.3.1.6, and 3.3.1.7. Independent biological opinions were provided by the USF&WS Fish and Wildlife Coordination Report and Biological Opinion. Alternatives are discussed in Sections 3.1.2 and 3.4.3. Committed and potential mitigation measures are discussed in Sections 3.3.5 and 3.3.6.

Pacific Project

Pacific has applied to the U.S. Army Corps of Engineers for dredge and fill permits to construct and operate a water intake and diversion facility on the Colorado River. In addition, Pacific will be applying at a future undetermined date for dredge and fill permits to mine sand and gravel on land located adjacent to the Colorado River near DeBeque.

The U.S. Army Corps of Engineers has been a cooperating agency during the preparation of this EIS. The Draft EIS was reviewed by the Army Corps of Engineers. Comments submitted by the Army Corps of Engineers have been responded to in this Final Environmental Impact Statement.

This Final Environmental Impact Statement fulfills the requirements of the National Environmental Policy Act for the Pacific Project. It is not the intended purpose of this document to fulfill the permit requirements of Section 404 of the Clean Water Act.

Please see additional information incorporated into Section 4.1.1.5 (Retorted shale disposal, Water supply and storage, Raw water treatment and use, Wastewater treatment and reuse, Retorted shale disposal pile abandonment), and responses to Comment Nos. 155, 173, 177, and 178.

Response to Comment No. 141

The Parachute Shale Oil Project (Mobil) and the Pacific Shale Project (Pacific) are separate, distinct projects. The only connection between the two projects is that, for administrative convenience, BLM chose to undertake their NEPA review simultaneously in one document. The project areas and the conditions under which the projects would operate are different; it is not unusual or unexpected that their evaluations of design alternatives might be different. Furthermore, there is no regulatory basis for comparing the projects just because they are being reviewed in a single EIS. Certainly there is no regulatory reason why the designs should be made similar. Other project sponsors have reached different conclusions on alternatives in their EISs.

See also response to Comment No. 161 on underground disposal of retorted shale.

Response to Comment No. 142

See the responses to Comment No. 141 anc Comment No. 106.

It is technically difficult to compare air emissions among projects as it is not clear which sources are included in the various source groupings. Assumptions on control technology also differ, given different stages of project development. The BLM's position, as stated in the EIS, is that "a worst-case scenario" has been modeled and that further refined emission estimates should be lower. Although emissions from these two projects differ, they are within the range of emissions proposed by other 100,000 bpd oil shale projects in western Colorado.

Both the Mobil Project and the Pacific Project will be required to comply with state and Federal air quality laws and regulations. Prior to issuance of a PSD permit, both projects will be required to perform a BACT (Best Available Control Technology) analysis which may result in reduction of project air emissions to levels below those indicated in the EIS.

Response to Comment No. 143

Please see revisions incorporated on FEIS pages 3-87, 4-92, and 4-93.

Response to Comment No. 144

The Unishale C retort is not being considered for use in the Mobil Project as it is considered to be too far from commercial development at this time. Should Unishale C technology become sufficiently developed in time to be included in Mobil's project schedule, it will then be considered.

Response to Comment No. 145

Please see pages 1-26 and 5-1. Also see response to Comment No. 42.

Response to Comment No. 146

The BLM concurs with the comment. The ground-water quality described in Section 3.2.5.1 for the Parachute Block is certainly better than that at some other locations in the Piceance Basin.

Ground-water quality is generally good along the basin's margins and ranges from good to very poor in the north-central portion of the basin. Total dissolved solids (TDS) concentrations generally increase towards the center of the basin where concentrations have been reported as high as 40,000 mg/l. TDS concentrations also typically increase with depth. Other ground-water chemical changes which occur during lateral movement from recharge to discharge areas include change of water type from mixed cation-bicarbonate to sodium-bicarbonate, oxidation and reduction of sulfate minerals, and general increases in concentrations of several trace constituents.

Response to Comment No. 147

A general geologic map could be shown; however, neither topography nor ground-water flow directions within the specific areas of interest could be realistically shown. Each aquifer has potentially different flow directions.

The entire mesa top is a recharge area with precipitation either being infiltrated, evaporated, transpired by plants, or becoming surface flow. Disruption of the infiltration to ground water could cause cessation of springs and seeps.

Response to Comment No. 148

Mobil will coordinate any future tests with appropriate agencies. Also, the response to Comment No. 139 discusses an analysis performed by In-Situ Inc. of the water quality effects of leachate. Leachate quality was estimated based on available information, including field leaching tests. The highest levels of contaminants available in the literature were used in the impact analysis.

Response to Comment No. 149

Please see Mobil's response to Comment No. 139 regarding quality of wastewater streams and potential water quality impacts. Page 3-24, first bullet, explains Mobil's proposed action for removal of arsenic from de-ash water. It should be understood that Mobil will not dispose of any wastewater considered to be hazardous waste with the spent shale.

Response to Comment No. 150

The processed shale will be placed in an unsaturated state and, therefore, has a capacity to adsorb additional water. This fact was one of the design considerations addressed by In-Situ Inc. (1984). In-Situ assumed that during operations the processed shale would not produce leachate until the shale is saturated to 50 percent by volume. Based on this assumption, it was shown that lift heights will be sufficient to prevent saturation from the estimated maximum probable precipitation. The procedure is discussed by In-Situ in their 1984 report.

During reclamation, the top compacted layer will minimize the potential infiltration of incident precipitation and snowmelt and, thereby, also minimize the potential for leachate generation.

Please see responses to Comment Nos. 121, 139, and 151.

Response to Comment No. 151

The goal of the processed shale operation is to provide an efficient disposal area while developing long-term embankment stability, zero liquid waste discharge and zero percolation to ground water. This will be accomplished by the following:

- Three- to 8-foot highly compacted base of processed shale for the bottom layer of the disposal pile (FEIS page 3-17, Section 3.1.5).

- Rock drains under the compacted layer to divert springs under and downstream from the processed shale pile (FEIS page 3-19, Section 3.1.1.5).

- Sealed flow structures and catchment dams to contain embankment runoff and recycle/evaporate said runoff (FEIS page 3-19, Section 3.1.1.5).

- Watershed interceptor ditches around the perimeter of the processed shale pile to segregate runoff (FEIS page 3-17, Section 3.1.1.5).

- Optimum moisture for embankment compaction, stability, and hydrologic requirements (FEIS page 3-17, Section 3.1.1.5).

- Highly compacted top layer on embankment to seal processed shale prior to final topsoil restoration (page 27, Section 2.7.4, Mobil Project Description).

- Final reclamation using a substrate suitable for vegetation, as soon as areas are available for restoration (FEIS page 3-36, Section 3.1.1.6).

- Final processed shale embankments will decrease the net upstream watershed to Wheeler Gulch, stabilizing the lower pile, and create the minimum upstream watershed for the upper pile, while allowing final drainage (to Parachute Creek) to remain unchanged (Figure 3.1-8, FEIS page 3-17).

- Ongoing research on processed shale operating and control parameters before, during, and after Upper Wheeler Gulch processed shale disposal (FEIS page 3-17, Section 3.1.1.5).

While Mobil recognizes the need for further analysis prior to specific permit applications, the above description is within the required scope of an EIS. Mobil expects the above steps to be successful; however, the response to Comment No. 139 discusses worst-case impacts were the steps less than completely successful.

Response to Comment No. 152

The volumes and areas of the processed shale disposal sites are as follows:

	Acres	MM CY
Upper Site	760	220
Lower Site	700	460
Total	1460	680

In addition, approximately 150 acres will be used for retention dams and ponds; in total, 1610 acres will be used for shale disposal.

With respect to gradient, the lowest Upper Site elevation contours are approximately 8200 feet with maximum pile elevation at 8600 feet (page 54, Section 1.5.1, Mobil Parachute Shale Oil Project, Project Description and Alternatives, Vol. 1), and is located along the slope crest illustrated in Figure 3.1-8 (Page 3-17, DEIS).

The lower site bottom elevation is 5700 feet msl (mean sea level) and the pile will reach a maximum height of 7400 feet msl along the north end of the pile, as illustrated in FEIS Figure 3.1-8 (page 3-18). Further detail is contained in Section 1.5.1 (Sequence and Method of Deposition), of Mobil Parachute Shale Oil Project, Project Description and Alternatives, Vol. 1.

Response to Comment No. 153

A report prepared for Mobil by In-Situ Inc. estimated that under worst-case conditions, the annual leachate generated might be 420 ac-ft/yr. Under more average precipitation conditions, leachate generated would be about 80 ac-ft/yr. These estimates were each based on a series of worst-case assumptions. These assumptions are identified in the response to Comment No. 139 and are discussed further in the In-Situ Inc. report. Actual leachate volumes might be much less. Leachate generation during embankment construction should be zero or negligible. These volumes were utilized to develop the impact estimate described in the response to Comment No. 139.

See response to Comment No. 178 regarding the water balance modeling for the Pacific Project.

Response to Comment No. 154

With respect to permeability, please refer to response to Comment No. 47.

Please refer to Comment No. 166 for discussion of a drainage layer above the bottom liner. The spent shale will be disposed as generated with no attempt at mixing or segregation.

Response to Comment No. 155

Mobil Project

Detailed discussions of the long-term abandonment plans are included in Section 3.1.1.6 and Sections 1.5.3.2 (Embankment Runoff Control System) and 1.13.2.3 (Decommissioning of Processed Shale Facilities) in the Mobil Parachute Shale Oil Project Description and Alternatives.

All areas will be restored by laying substrate (rock and topsoil) by revegating with site-specific seed mixtures, and by irrigating in the first growing season. After reclamation, embankment runoff will be released to natural drainages via riprapped and grouted channels. All dams will be removed to avoid flood hazards. It should be noted that reclamation actually begins well before the end of the project life, commencing as areas are filled.

See the response to Comment No. 139 for a discussion of long-term water quality impacts.

Pacific Project

See description of retorted shale disposal pile abandonment in Section 4.1 and response to Comment No. 178.

Response to Comment No. 156

Figure 1.5-4 (page 61) of the Mobil Parachute Shale Oil Project Description and Alternatives Volume 1 illustrates the current design of the dam structure. The dam and retention pond will be built to required future permit requirements; specifically after review with the Colorado State Engineer's Office. Preliminary data have been used to size these structures and are as follows:

100 year, 24-hour storm	3.5 inches
*Maximum 1-hour PMP	7 inches

These parameters are preliminary in nature and may be revised after future permit work; nevertheless, they are site-specific assumptions and account for the known meteorological conditions of the area. The ultimate precipitation value used for design criteria will be dependent on review by the Colorado State Engineer's Office, Division of Water Resources and Dam Safety.

*Figure 1.5-4 of the Mobil Parachute Shale Oil Project Description and Alternatives Volume 1 is in error; the current design assumes 1-hour local probable maximum precipitation (PMP).

Response to Comment No. 157

Please see response to Comment No. 139, first paragraph.

Response to Comment No. 158

Please see FEIS Table 3.1-4 on page 3-21.

It is planned that raw shale fines will be retorted in the TOSCO II retort. The raw shale material listed in Table 3.1-4 is dust. When dust is fed to the TOSCO II retort, it is carried out of the lift pipe with the flue gas prior to retorting and collected in the baghouse. (See page 44 of the Parachute Shale Oil Project, Project Description and Alternatives, Vol. 1, for a schematic drawing of the TOSCO II retort.) Approximately 85 percent of the raw shale dust for disposal already comes from this source. Continued attempts to retort raw shale dust in the TOSCO II retort would decrease production of shale oil, overload the baghouse collection system and would not result in any increased recovery of the resource.

Response to Comment No. 159

The following are excerpts from page 60 of the Parachute Shale Oil Project, Project Description and Alternatives, Volume 2:

TOC and BOD Reduction

The following biological oxidation systems were evaluated:

- Activated sludge/secondary clarification
- Packed biotower followed by activated sludge
- Packed biotower followed by rotating biological contactors
- Activated biofilter (a proprietary process of Neptune Microfloc similar to biotower) followed by activated sludge.

The activated sludge/secondary clarification system was selected on the basis of costs and simplicity of design and operation.

Response to Comment No. 160

FEIS page 3-30, Section "Electrical Power Supply" states "Onsite power production is proposed, using coke produced in the delayed coke plant as a base fuel to generate 184 megawatts (MW) . . . Natural gas, at a rate of approximately 10 percent (on a Btu basis) would provide startup, flame stabilization, and makeup fuel."

Please also see response to Comment No. 163.

Response to Comment No. 161

Mine disposal of processed shale was evaluated and considered inappropriate for the project due to economic, logistic, and environmental difficulties. These are further elaborated in Section 2.2.5.1 of the Parachute Shale Oil Project, Project Description and Alternative, Vol. 2.

Total underground disposal was eliminated because it would not be possible to place all the processed shale in the underground mine workings, since the oil shale will increase in volume due to excavation and crushing. With underground disposal, at least 30 percent of the processed shale would have to be disposed on the surface. Partial underground disposal with some surface disposal also has several disadvantages when compared to total surface disposal. Partial underground disposal would require two conveying and disposal systems, necessitating greater capital cost. The logistics of underground disposal are more difficult, and thus, operating costs would be greater than for complete surface disposal. The complicated logistics of underground disposal could interfere with mining.

Capital costs would double for underground conveyors and ventilation fans, pre-mine development would increase by at least 50 percent, while surface belts and site preparation would decrease only by 50 percent, due to the fact that only 70 percent of processed shale can be deposited underground. Operating costs would increase significantly--underground productivity is at least half surface productivity. Equipment underground is more expensive per ton disposed (150 T truck vs 15 cy loader). Ventilation costs would more than double due to twice the workings required and the need to absorb the heat transfer from 115,000 tpd of 190° processed shale. Surface costs of the remaining 30 percent of processed shale would be higher due to fixed costs increasing per ton of shale.

A further complication arises from the safety ramifications of entering mined-out areas for disposal and possible ventilation difficulties associated with this operation. Another disadvantage of underground disposal is the difficulty of controlling subsequent contamination of the aquifers by the processed shale. Mobil does not feel that current technology allows the in-mine disposal of processed shale or future secondary shale recovery.

Response to Comment No. 162

Comment noted.

Response to Comment No. 163

Use of the carbon on retorted shale would have little affect on the need for natural gas should carbon recovery technology become available in the future. The great majority of natural gas requirements are for flame stabilization in the power generation facilities and for hydrogen plant feedstock, uses which carbon on retorted shale could not replace.

The Mobil Project has minimized the use of natural gas for fuel by using low-Btu gas from the Paraho retorts as the primary fuel for steam production, coke from the delayed coke plant as the primary fuel for power generation, and fuel gas produced in the TOSCO II retorts, Union-B retorts and upgrading processes for use in utility plants and process furnaces.

The process configuration of the proposed Union project includes one retort technology, an upgrading scheme without coking and numerous other differences from the Mobil Project. A conceptual comparison of the project fuel balances to one another is inappropriate.

Response to Comment No. 164

Please see FEIS page 3-63 for additional information on springs and seeps.

Possible effects of mine dewatering and waste disposal on springs and seeps are discussed on page 3-103.

Response to Comment No. 165

The raw shale stockpile water runoff is considered as Raw Shale Handling Water and will be disposed into the process plant industrial water system as itemized in Tables 3.1-5 and 3.1-6, FEIS page 3-22 and 3-23.

The quantity is integrated with other runoff and is part of the 1200 gpm routed from secondary crushing to plant process water. This is shown in Figure 3.1-10 (Water Balance Diagram). For further discussion, please see FEIS page 3-15, Section 3.1.1.5.

Response to Comment No. 166

Rock underdrains below the compacted shale liner have been proposed for the Parachute Project for springs buried by the processed shale embankment, as per Section 3.1.1.5, page 3-19. Further discussion is available in Section 1.5.3.2, page 57 of the Parachute Shale Oil Project, Project Description and Alternatives, Vol. 1.

A drainage layer above the compacted liner is not currently envisioned for the design, but will be considered for future studies. References to a drainage layer are used in the context of saturated piles, where the phreatic surface is at or near the top of the pile (RI 8544, Design Parameters for Oil Shale Waste Disposal Systems).

The processed shale pile will not be deposited in saturated conditions, and the following quotation from Johnson and Cartwright (Implications of Solid Waste Disposal in the Unsaturated Zone, Illinois State Geological Survey, 1978) indicates that the drain may not be effective:

> "In unsaturated soils, infiltration may actually bypass a leachate collection system, especially if the collection system consists of a narrow, coarse-gravel drain overlying a wide liner that has low permeability" (page 239).

The conclusions of the Johnson and Cartwright study state that further research is needed to evaluate the effectiveness of gravel drains and landfill liners as leachate collection systems in unsaturated materials. Whether or not the processed shale, which will be disposed as unsaturated, will eventually become saturated is uncertain. The response to Comment No. 139 discusses a worst-case study which assumes eventual saturation of the processed shale. This theoretical assumption was made to determine worst-case leachate effects on the Colorado River.

Mobil recognizes the need for further analysis of the need for drainage but defers final judgment until future site-specific studies are accomplished. There will be close evaluation of pile construction design and this design detail will be addressed. If an underdrain is needed, it will be provided.

Response to Comment No. 167

The spill potential from any pipeline is a function of the original pipeline design and the age of the pipeline. Modern-day pipeline construction is considerably advanced over that of "average pipelines" currently in use. The use of "average spills from a 100 TBD pipeline" is inappropriate as Mobil intends to construct two parallel 50-TBD pipelines to better suit project development plans (page 3-31). Based on this analysis, the use of "average annual loss of 28 barrels of oil along the 10-mile route" appears appropriate for a worst-case analysis of impacts.

Mobil's pipeline design will include the following design and operational monitoring systems for spill prevention:

- Mobil's syncrude pipeline will be designed, constructed, and operated in compliance with all Federal and state standards for liquid pipelines, including the Department of Transportation (DOT) Title 49, Part 195, Transportation of Liquids by Pipeline, American National Standards Institute (ANSI) B31.4,.and applicable American Petroleum Institute (API) codes.

- Gate and check valves will also assist in isolating segments for the initial hydrostatic testing of the line. Surge relief will be accomplished by having a relief valve at the terminal connecting the main line to open tankage.

- The pipeline will be continuously monitored by a computer-based supervisory system in the main control building. This system will allow the pipeline operator to monitor and control all pipeline, terminal, and metering functions from a single location. This control facility will be staffed 24 hours per day and it will be equipped with an alternate power source for continuous monitoring in the event of a primary power failure. If a complete loss of communications occurred, the pipeline would be shut down until the supervisory system was back on line.

- Patrols would be conducted to inspect the right-of-way for leaks, erosion, and unauthorized activity on the right-of-way. Vehicular traffic on the right-of-way would be restricted to these patrols, valve inspections, right-of-way maintenance, corrosion surveys, and emergency repairs to the pipeline.

- Normal, abnormal, and emergency operating procedural manuals will be prepared before the initial operation of the system. These manuals will contain detailed written procedures for conducting normal operations and maintenance activities and for handling abnormal operations and emergencies. Spill prevention control and countermeasure (SPCC) plans will be prepared for the facilities as required by the EPA. Spill containment and clean-up equipment, and other equipment to respond to emergencies, will be available. Personnel will be well trained in emergency procedures.

Response to Comment No. 168

Mitigation methods are not alternative actions. Please refer to page 3-174, Section 3.3.5, first paragraph for a definition of mitigation.

Section 3.1.1.6 (Site Development, Reclamation and Decommissioning) refers to surface drainage control; pages 3-35 and 3-36 discuss permanent diversion ditches. Further discussion is available in Section 1.5.3 (page 57) of the Parachute Shale Oil Project, Project Description and Alternatives, Vol. 1.

The same section (page 3-36) alludes to a low permeability top layer prior to revegetation, ". . . the cover material would be applied directly to a completed portion of the graded and compacted processed shale embankment. . . ." Section 2.7.4 (Compaction Methods, page 27) of the Parachute Shale Oil Project, Project Description and Alternatives, Vol. 2 states, "All final faces of the embankment will be highly compacted."

Also, see responses to Comment Nos. 121 and 151 and FEIS Tables 3.3-20 and 4.3-25.

Response to Comment No. 169

Please see response to Comment Nos. 138 and 144.

Response to Comment No. 170

Research conducted by the U.S. Bureau of Mines at the Demonstration Mine, Anvil Points Oil Shale Research Center near Rifle, Colorado, determined that 60-foot-square pillars provided stable support with 75 percent extraction. Work at the Anvil Points Research Center during the period 1964 to 1968, by the Mobil Oil Corporation and others, determined that an 80 percent extraction ratio was feasible with pillars 40 feet by 40 feet and 75 feet high (Sellers et al., 1982 and Bureau of Mines, 1964).

The Final Supplemental Environmental Impact Statement for the Prototype Oil Shale Leasing Program (BLM, 1983) states: "Many of the modern oil shale room-and-pillar mine designs are patterned after the design developed by the U.S. Bureau of Mines. From Bureau studies it was concluded that 60-foot rooms with 60-foot-square pillars would maximize resource recovery, prevent subsidence, and provide a safe working place. Recoveries using this mine design will approach 70 percent if the full thickness of the ore zone can be mined."

Reference to environmental impact statements for other oil shale projects provides the following information: Mobil proposes to use the lane-and-pillar mining method, not room-and-pillar, and the percentage of oil shale removed is not stated (BLM, 1984, Mobil-Pacific Draft EIS). Colony proposes nearly 60 percent extraction of the shale by room-and-pillar mining. Pillar size is not stated (BLM, no date, Final EIS Proposed Development of Oil Shale Resources by the Colony Development Operation in Colorado, Volume I). Chevron proposes a minimum extraction of 60 percent in the underground mine. Pillar size is not stated (BLM, 1983, Clear Creek Shale Oil Project Draft EIS).

Union proposes pillars 50 feet by 100 feet and approximately 60 percent recovery of the oil shale (Colorado Mined Land Reclamation Division Permit Application).

REFERENCES

Sellers, J.B., G.R. Haworth, and P.G. Zambas, 1972, Rock Mechanics Research on Oil Shale Mining, Trans. SME-AIME, Vol. 252, No. 2.

U.S. Bureau of Mines, 1964, Oil Shale Mining, Rifle, Colorado, 1944-1956, by J.H. East, Jr. and E.D. Gardner, Bureau of Mines Bulletin No. 611.

Response to Comment No. 171

Comment noted.

Response to Comment No. 172

Pacific has redesigned the face of the retorted shale disposal pile to incorporate 3-foot-wide benches for every 25-foot-vertical increment. The resultant calculated soil loss by erosion would be reduced from approximately 49.3 tons per acre per year to approximately 11.6 tons per acre per year. A 4 to 1 slope for the embankment face of the proposed Deer Park Gulch retorted shale disposal pile would not be reasonable considering that approximately twice as much land surface would be disturbed by the embankment of the retorted shale disposal pile. With the proposed plant siting and retorted shale disposal pile siting, Deer Park Gulch would not have sufficient capacity for a 4 to 1 slope of the embankment face.

There are numerous examples of successful reclamation on 2 to 1 slopes and on soils similar to those in the Pacific Project area. Reclamation of the embankment face will be conducted in compliance with the Colorado Mined Land Reclamation Act and the Colorado Mined Land Reclamation Board Rules and Regulations.

Response to Comment No. 173

Surface-water runoff and ground-water discharge from the Uinta aquifer and the Upper Parachute Creek aquifer (leach zone) would be diverted around the retorted shale disposal pile. This diversion would eliminate recharge to the alluvial aquifer in the area of the disposal pile. Below the leach zone lies 200 or more feet of marlstone which has little or no fracturing. The Mahogany Oil Shale Zone is not regarded, either on the Pacific Project area or regionally, as a significant water-bearing interval. Drill core data from seven holes on the Pacific property further indicate a lack of either primary or secondary permeability within the zone. No significant water-bearing intervals exist below the proposed mining zone. Neither significant recharge to nor discharge from strata below the mine zone (Mahogany Zone) occurs on the Pacific Project area.

Please see additional information incorporated into Section 4.1.1.5 regarding retorted shale disposal and retorted shale disposal pile abandonment.

Response to Comment No. 174

Many environmental factors (e.g., wildlife, vegetation, air quality) were considered during selection of the preferred alternative. Whereas the Mesa Top Plant Site Location Alternative may be preferred in regard to air quality, the proposed action is preferred in regard to wildlife (see Comment No. 66 from U.S. Fish and Wildlife Service).

In any event, it will be necessary for the Pacific Project to comply with state and Federal air quality regulations and permitting requirements.

Please see Section 3.4.4 and Section 4.4.4 for an explanation of the BLM's agency preferred alternative.

Response to Comment No. 175

Title 40, Code of Federal Regulations, Part 260 (40 CFR 260) defines hazardous waste pursuant to the Resource Conservation and Recovery Act of 1976 as amended (RCRA). Per 40 CFR 261.4(b) (3), "mining overburden returned to the mine site" and "(7)" Solid waste from the extraction, beneficiation, and processing of ores and minerals (including coal), including phosphate rock and overburden from the mining of uranium ore," are exempted from hazardous waste regulation under subtitle c. Per 40 CFR 261.2(a), "A solid waste is any garbage, refuse, sludge or any other waste material which is not excluded under § 261.4(a)."

Therefore, due to the "mining waste exemption," waste materials from the processing of oil shale are not managed as hazardous wastes. Retorting is the processing of oil shale. Waste materials from retorting such as retorted shale, wastewater sludge, etc., are exempt from hazardous waste regulation.

Hazardous wastes would include waste products from hydrotreating (upgrading). Wastes from upgrading are not included in the mining waste exemption but not all upgrading wastes are hazardous wastes. Hazardous upgrading waste products would include spent catalysts from hydrotreating, hydrogen generation, and sulfur recovery; spent packings from sour water treatment; and oil sludges from hydrotreating and oil-water separation.

Hazardous wastes would be identified in compliance with Title 40, Code of Federal Regulations, Part 261, Identification and Listing of Hazardous Waste. All wastes generated by the Pacific Project would be evaluated to determine if they meet the criteria for classification as a hazardous waste. Listed hazardous wastes (40 CFR 261, Subpart D) would not be mixed with other wastes, because any amount of a listed hazardous waste would cause the mixture to be regulated as a hazardous waste (EPA, 1980).

REFERENCE

Environmental Protection Agency, 1980, Questions and Answers on Hazardous Waste Regulations.

Response to Comment No. 176

Dr. McWhorter of Colorado State University (undated reports) has conducted laboratory and field leach tests on raw mined shale from the Federal Oil Shale Lease Tracts Ca and Cb. The mean concentration of dissolved solids in the leachate from the raw shale piles ranged from 60,220 mg/l in the Ca leachate to 6850 mg/l in the Tract Cb leachate (McWhorter, undated a and b). Saline minerals (nahcolite, dawsonite, and halite) are more concentrated with oil shale in the regions of Tracts Ca and Cb, than in the southern portion of the Piceance Basin near the Pacific property (BLM, 1984). A higher concentration of soluble salts may be present in the raw shale and in the leachate at Tracts Ca and Cb than would be present in the raw shale and leachate from the Pacific Project. However, Pacific's raw shale could potentially produce leachate with moderate levels of dissolved solids. Therefore, Pacific would place a liner beneath the raw shale stockpiles to prevent leachate infiltration. Surface runoff and leachate would be properly contained and treated.

REFERENCES

McWhorter, David B., undated(a), Quality and Quantity of Leachate from Raw Mined Colorado Oil Shale, Environmental Research Brief.

McWhorter, David B., undated(b), Quality and Quantity of Leachate from Raw Mined Colorado Oil Shale, for U.S. Environmental Protection Agency.

U.S. Bureau of Land Management 1984, Piceance Basin Resource Management Plan and Environmental Impact Statement.

Response to Comment No. 177

See response to Comment No. 173.

Response to Comment No. 178

In-Situ Inc. was contracted by Pacific to conduct water balance modeling of the retorted shale disposal pile. The report of this study, "Studies Involving Water Resources Issues, Pacific Shale Project," (In-Situ, 1984) is available for public use in the BLM's Grand Junction District Office. Following are the Summary and Conclusions from the report.

SUMMARY AND CONCLUSIONS

"The purpose of this study was to evaluate the water-resources impacts of retorted shale disposal resulting from the Pacific Shale Project as described in the Mobil-Pacific DEIS (U.S. Bureau of Land Management, 1984). Leachate and runoff potential of the shale disposal pile were estimated using the best currently available climatic and shale-technology information. These data were incorporated into an analytical unsaturated flow model (Kunkel and Murphy, 1983) to simulate both project-operation (during pile-construction) and post-reclamation phases of retorted shale disposal.

The overall goal of disposal pile design will be to minimize contact of water with shale and to minimize leachate production. This will be accomplished during the construction phase by laying down lifts of sufficient thickness over the surface of the pile to store any water infiltrating the pile while that lift is exposed. As long as sufficient void space is available in the shale to store infiltrating water, any leachate generated during pile construction would be minimal. During the post-reclamation stage, leachate production will be minimized through use of a highly compacted shale cap to minimize infiltration prior to revegetation and the use of a vegetated soil cover to remove moisture by evapotranspiration. However, reconstructed channels across the top of the pile at the end of project operation will act as a line source contributing to additional leachate generation of the pile. These engineering concepts were considered in the shale pile model simulation analyses described in this report. Current engineering design concepts are preliminary and will be subject to change after more information is available on the hydrologic behavior of the pile.

The leachate- and runoff-potential analyses were conducted using a statistical approach. Monthly precipitation inputs were assessed based upon the probability of time annual values for input to the model. Leachate and runoff generation based on the probability of the wettest year in 2, 5, 10, 20, 50, and 100 years (50, 20, 10, 5, 2, and 1 percent chance years, respectively) were estimated. Results of the unsaturated flow modeling in terms of runoff and leachate potential, both during construction and post reclamation, for the Pacific retorted shale disposal pile are summarized as follows.

Runoff during pile-construction from the Pacific pile is estimated to range from approximately 2.5 inches for the 50 percent chance year to about 7.0 inches for the 1 percent chance year of annual precipitation. Water infiltrating the Pacific pile from precipitation during construction ranges from a minimal amount (0.02 inch) for the 50 percent chance year to about 3.4 inches for the 1 percent chance year.

Post-reclamation runoff from the Pacific pile was estimated to range from about 3.3 inches (190 ac-ft/yr) for the 50 percent chance year to about 8.4 inches

(470 ac-ft/yr) for the 1 percent chance year. With additional water from reconstructed channels acting as a line source over the top of the Pacific pile, the long-term leachate potential of the pile would range from 1.9 to 7.2 inches (110 to 400 ac-ft/yr) for the 50 percent and 1 percent chance years of annual precipitation, respectively.

To assess water-quality impacts, analyses were conducted for the following chemical constituents: dissolved solids, sulfate, total organic carbon, arsenic, boron, fluoride, and selenium. Under worst-case assumptions (1 chance in 100 annual precipitation associated with generation of leachate and runoff form the Pacific pile), localized water-quality impacts in Roan Creek near its confluence with the Colorado River might result in up to 34 percent increases in chemical loads for these constituents. However, the absolute change in concentrations associated with the relative (percent) anticipated changes is a more useful comparison. For example, the maximum anticipated increase in selenium due to an effect of combined leachate and runoff from the pile could be about 4.7 g/l compared to an ambient level of 3.5 µg/l and a Colorado stream standard of 20 mg/l for selenium in Roan Creek upstream from Clear Creek. The results of the water-quality impact analysis indicated that no Colorado standard would be exceeded for the selected constituents (arsenic, boron, and selenium), for all cases where stream standards apply to Roan Creek. Under the worst-case assumptions (1 percent chance associated with annual precipitation input to pile), dissolved solids concentrations in lower Roan Creek might increase by about 4 percent (from 850 to 888 mg/l) and sulfate concentrations might increase 8 percent. In the regional water-quality impact analysis for the Colorado River in Colorado, the comparisons with currently applicable state standards for the selected constituents show a negligible impact.

In summary, worst-case assumptions were made regarding the water-balance and water-quality impact analyses. These impacts considered extreme conditions (1 percent chance year in the case of annual precipitation contributing to the pile) and assumed no attenuation or reduction of chemical loads by physical, chemical, or biological processes."

The following data were used in the unsaturated flow model to predict the water resource impacts of the retorted shale disposal pile.

During Construction Retorted Shale Characteristics

Dry Density	86 lb/ft^3
Porosity	46 percent
Saturated Hydraulic Conductivity	50 ft/yr
Field Capacity	23 percent by volume
Permanent Wilting Point	11 percent by volume
Placement Water Content	16 percent by volume

Post-Reclamation, Reclamation Zone Characteristics

Reclamation Zone	Surface to 6-foot depth
Soil	Surface to 3-foot depth
Dry Density	89 lb/ft^3
Porosity	46 percent
Saturated Hydraulic Conductivity	50 ft/yr
Field Capacity	23 percent by volume

Permanent Wilting Point	11 percent by volume
Placement Water Content	23 percent by volume
Initial Water Content	16 percent by volume
Compacted Retorted Shale	3-foot depth to 6-foot depth
Dry Density	99 lb/ft^3
Porosity	38 percent
Saturated Hydraulic Conductivity	1 ft/yr
Field Capacity	19 percent by volume
Permanent Wilting Point	9 percent by volume
Placement Water Content	35 percent by volume
Initial Water Content	19 percent by volume

Climatic Factors

Retorted Shale Disposal Pile Elevation	7725 ft MSL
Annual Precipitation	
50 percent chance (1 year in 2)	22.60 inches
20 percent chance (1 year in 5)	26.02 inches
10 percent chance (1 year in 10)	27.95 inches
5 percent chance (1 year in 20)	29.62 inches
2 percent chance (1 year in 50)	31.60 inches
1 percent chance (1 year in 100)	32.97 inches
Annual Evapotranspiration	14.16 inches
Annual Free Water Surface Evaporation	62.04 inches
Average Annual Temperature	41.8°F
Average Annual Wind Speed	7.7 mph
Average Annual Relative Humidity	45 percent
Average Annual Runoff	4.3 inches

The data used in the unsaturated flow model are the best currently available for modeling the "worst case" water resource impacts.

Response to Comment No. 179

See response to Comment No. 172.

Response to Comment No. 180

The predicted cumulative SO_2 and particulate concentration in regional Class I areas may appear low compared to previous analyses because of the way the TAPAS model was applied. Previous EIS analyses used TAPAS assuming constant wind speed and direction for up to 24 continuous hours. The Mobil-Pacific EIS uses actual measured hourly meteorology for transport of emissions to the sensitive areas. The hourly meteorology that was used consisted of worst-case periods selected from 18 months of continuous data measured at Mobil's Roan Plateau monitoring site. TAPAS was applied this way because of the availability of appropriate input data. This is more realistic than assuming constant winds.

Response to Comment No. 181

The Gary Western Refinery is an existing source and is, therefore, accounted for in the measured background concentrations. The locations of the assumed cumulative sources are shown in Figure 5.1-1. Also see response to Comment No. 42.

Response to Comment No. 182

See discussions of cumulative impacts on air quality in Section 5.1 and on water quality in Section 5.5 and Section 5.6.2.

Response to Comment No. 183

Cumulative impacts on ground water will occur where the drawdown cones resulting from mine dewatering/depressurization activities overlap. Where cumulative impacts occur the effect on water levels within the Mahogany Zone and the overlying strata will be greater than where proposed oil shale operations are physically and hydraulically isolated. The impact of individual operations and the cumulative impacts of multiple operations could result in cessation or reduction of ground-water discharge in springs and seeps.

Subsidence of the land surface as a result of mining could result in the establishment of hydraulic intercommunication between the land surface and the mining zone. This could in turn result in drainage of perched ground water within the overburden and reduction in wetland areas. The physical removal of portions of the Mahogany Zone as a result of mining will disrupt the continuity of the low-permeability layer. This in turn will result in an increase in potential for downward percolation from the overburden through the Mahogany into the underlying strata. This could result in a gradual increase in ground-water levels below the Mahogany Zone which would be manifested in increased ground-water discharge along the margins of the Roan Plateau beneath the Mahogany Zone.

Because of their location on the southern edge of the Piceance Basin where the direction of ground-water flow is toward the edge of the basin, the Mobil Project and the Pacific Project would have only minimal effects.

Response to Comment No. 184

The fugitive TSP modeling (ground level and elevated emissions) was performed for the DEIS using 6 months of continuous meteorological data from the Lower Deer Park monitoring site. This modeling was updated using 12 months of meteorological data for the FEIS. These data included both conditions of light winds and a stable atmosphere as well as windy neutral conditions. Two explanations are possible for why elevated plumes, not surface fugitive emissions, apparently caused the highest concentrations. First, using the Complex I model, the elevated plume impacts on nearby valley walls before significant plume dispersion has occurred. Secondly, the observed wind in Lower Deer Park may not be as strong as one would expect because of the constricted topography blocking strong mesoscale wind flow.

Response to Comment No. 185

The primary reason maximums for several averaging periods occurred at one receptor is because of the location of the property line, not a scarcity of receptors. Figure 4.3-1 of the FEIS shows an indentation of the property line where these concentrations were predicted to occur. The indentation is the nearest (5000 feet) off-property elevated terrain receptor which the plume would impact. Other high terrain impaction points are all on the property. Receptor maps with an expanded receptor grid have been included in the Final EIS.

Response to Comment No. 186

See response to Comment No. 112.

Response to Comment No. 187

Potential acid deposition within the Mt. Zirkel Wilderness Area was estimated based on 24-hour TAPAS model results as explained in the Air Quality Technical Report Section 5.8. Annual values were estimated based on an averaging time relationship which should not be used to determine PSD increment consumption.

Response to Comment No. 188

Information on the accuracy, strengths, and weaknesses of each model is contained in the introductions of Sections 5.3 through 5.7 of the Air Quality Technical Report.

Response to Comment No. 189

While one full year of onsite data from the Mobil Project site would be preferable, the data provided are consistent with data generated by other projects in this region. By comparison (see Table 2.1-3 of the FEIS) one can conclude that the existing air quality at the Mobil Project location is not significantly different from air quality measured over longer terms at other oil shale projects in the region.

Response to Comment No. 190

Please refer to response to Comment No. 25. It is unfortunate that the DEIS wording allowed misinterpretation. It was not the BLM's intent to mislead.

Response to Comment No. 191

The BLM does have a protest and appeal procedure. The rules governing the process are described in 43 Code of Federal Regulations, Part 4.

These regulations are available for review at the Grand Junction District Office of the BLM.

Response to Comment No. 192

Both Mobil and Pacific will work with local citizens to minimize impacts of the projects. Each project's business will be between themselves and private landowners.

Response to Comment No. 193

The BLM believes that the public review process during the preparation of this EIS has been open and information has been available to the public at all steps of preparation. Please see FEIS pages 1-19 to 1-25 for a description of the public involvement.

Response to Comment No. 194

These comments correspond to Comment Nos. 18 through 24. Please refer to responses to Comment Nos. 18 through 24.